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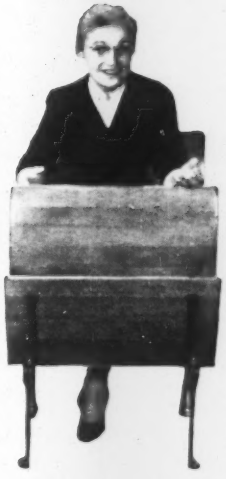

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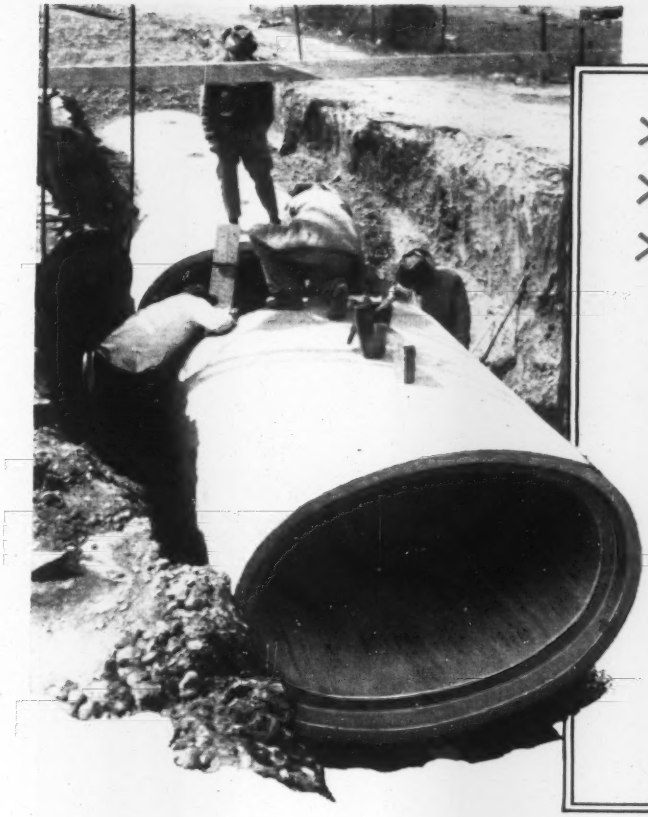

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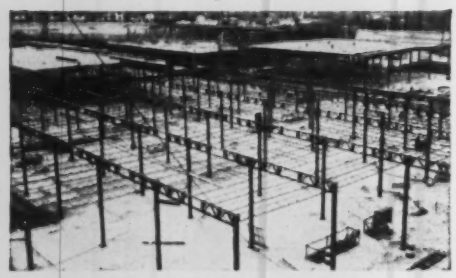

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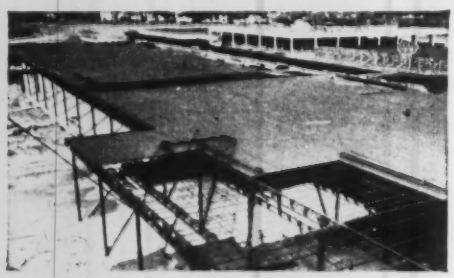

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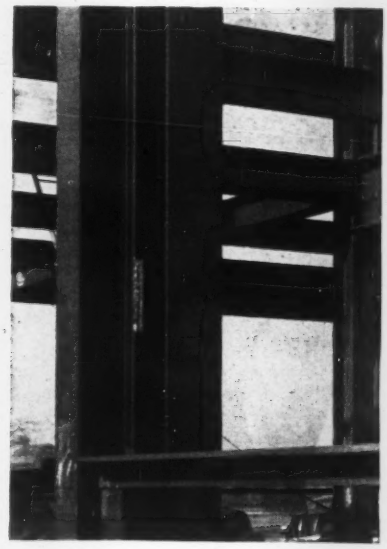

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Answers on Bolt Tightening

Reader G. R. Stifler's letter concerning failures in high-strength bolts drew thought-provoking replies

A Research Answer . . .

SIR—In his letter (ENR Jan. 29, p. 8) Mr. Stifler reports experiences where bolts have not only relaxed "before they reached the yield point" but have continued to "elongate and fail over a period of time."

Bolts meeting the requirements of ASTM Specification A325 are limited at elastic proof load to an inelastic elongation no greater than 0.0005 in. The stretch of such bolts, wrench-tightened to failure, regularly exceeds 300 times this amount.

In fabricating test specimens at Lehigh University, A325 bolts were strained to 100 times the permanent elongation permitted at elastic proof load by using a one-half-turn-of-the-nut procedure. The bolts have shown no relaxation after ten months. They then developed as great a resistance to shearing as similar bolts tightened only to elastic proof load.

It is apparent that Mr. Stifler's experiences, cited above, could not have involved bolts meeting the requirements of A325.

The Research Council on Riveted and Bolted Structural Joints, sponsors of the assembly specification for high-tension bolts, never recommended that tightening should be carried to the point of incipient failure. On the other hand, it does not believe that an upper limit on tightening need be specified at the initial yield point. Some tightening in excess of this value can be expected whether wrench calibration or turn-of-the-nut is used as the means of control. However, when bolts are tightened in accordance with recognized procedures, any resulting inelastic strains are safely below those associated with incipient failure.

Fatigue tests performed at the University of Illinois and reported in ASCE Proceedings Paper No. 650 showed that the endurance limit of A325 bolts subjected to an applied pulsating tension load improved as initial tightening was increased at least up to 120% of the elastic proof load, the highest value studied.

Pretension	Applied Tension	Cycles to Failure
0.1*	0.6*	9,700
0.6	0.6	127,600
0.9	0.6	231,000**
1.2	0.6	453,000**

* Values given in terms of elastic proof load.
** Average for more than one test.

The applied test load was 2.4 times the presently recommended design shear value. All the applied load, of course, was resisted directly by the bolts without the assistance of friction between connected parts. This is not the case of joints loaded in shear. It would appear that no useful purpose would be served by limiting pretension to initial yield point, whether the service conditions of the bolts is that of resisting shear or applied tension.

Resistance to slip, likewise, is improved when the pretension is taken well above the elastic proof load.

In the past, a few instances were reported where relatively soft nuts were matched to bolts having actual elastic proof loads substantially above the specified minimum, with some consequent thread stripping in the nuts, when tightening was controlled by turn of the nut. As a result, ASTM Specification A325 has been revised, raising the proof load for nuts. Subsequently, no thread stripping has been reported.

T. R. HIGGINS
Director of Engineering and Research
American Institute of Steel Construction, Inc.
New York, N. Y.

An Engineer's Answer . . .

SIR—We were interested in Mr. Stifler's letter (ENR Jan. 29, p. 8) since we have also run into discrepancies in bolt tensions. However, we have discovered no actual failures in erected bolts, though we have probably installed several million by now.

We have run rather extensive experiments on bolt tensioning and inspection, resulting in these general observations:

- Installing high-strength bolts, the steel must first be drawn tight. Then one-half turn on all bolts from a snug position will produce more than minimum required tension.
- Our experience with calibrated wrenches has been poor, since it is very difficult to obtain the same result twice with the same calibration.
- Inspecting bolts, we find that if a nut is moved into the forward position with a torque wrench, it will always read much higher than the installed torque. We get a much more accurate reading by marking the nut, backing it off and returning it to its original position.
- We have run tests on bolts correlated against time by reading them at intervals of 15 minutes, a half hour, one hour, etc., up to 60 days from time of installation. Reading the tension on the nut by the back-off method, we find time has no effect on the reading. If the wrench is moved into the forward position, however, there is a direct relationship between the time interval and the reading. That is, readings increase as time goes by.

M. ZAR
Sargent & Lundy, Engineers
Chicago, Ill.

An Erector's Answer . . .

SIR—Here's a non-technical comment on G. R. Stifler's letter.

One way to look at this is to think of the process as "the tightening of the fastener to a point where the bolt is just below failure while under tension and torque, combined." Removing the torque obviously leaves the fastener functioning in tension alone.

The relationship between the applied torque and the resultant tension value is theoretical and in our experience not too reliable. Therefore, we prefer a more or less empirical procedure, such as the "Turn of the Nut Method." At a fastener seminar, this was once expressed as the "THOOT Method," ie, "Tighten the hell out of them."

PATRIC E. SIMONE, *PE*
Plant Structural Engineer
Cleveland Works Division
Jones & Laughlin Steel Corp.

Continuous Framing Fails

SIR—Concerning the collapse of the folded-plate concrete roof at the Park Davis & Co. building in Chicago. (ENR March 5, p. 23), your story makes two statements that indicate a possible cause of failure:

- "They (the folded plates) are not continuous over the bent and do have some negative reinforcement," and . . .
- "One possibility is that the folded-plate roof slabs failed in bending or bearing at the central bent. Another possibility is that failure started in the negative steel over that bent."

First, continuity is established when reinforcing steel or welded connections are used to connect any precast member over an interior support if the steel or connection is located near the top of the member and if the opposing end of the members are prevented from moving with respect to each other, either by welded connection or by grout placed between them. But if the area of the top tie is insufficient or if

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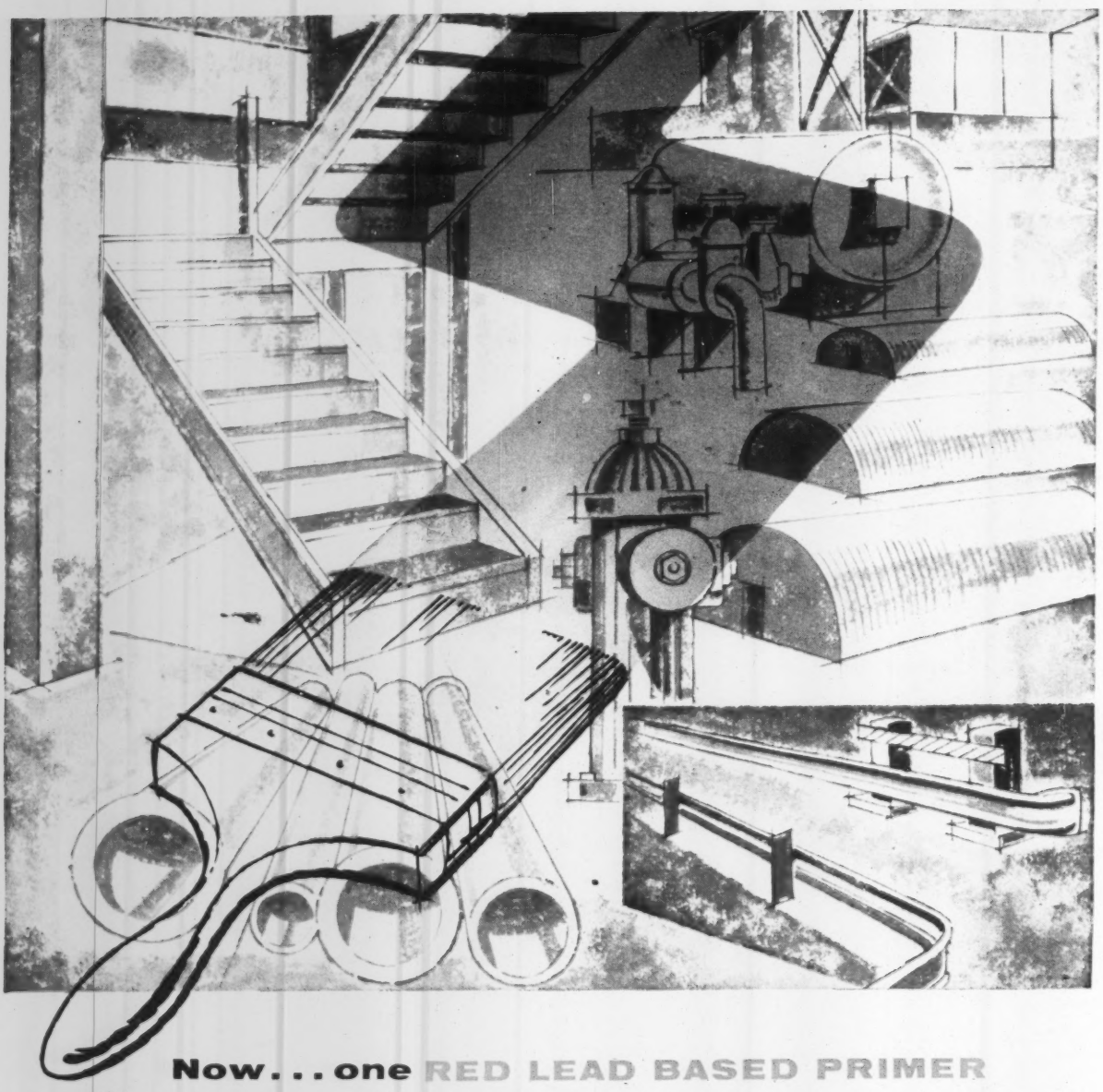

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it does not extend past, or at least approach, the point of inflection in each of the members, then the possibility of failure exists.

Failure will occur when cracks form in the top of the member due to lack of sufficient reinforcing area to resist the negative moments. Or cracks may form at the end of the reinforcement if it does not extend far enough into the members; once these cracks form, failure can occur by shearing.

It does not matter that positive reinforcement in the precast member is sufficient to resist both live and dead loads. If enough rotation occurs at the interior support to form the crack, then the possibility of failure exists due to shearing of the concrete section.

This rotation may be due to the application of loads after establishment of the tie, or due to changes in camber or deflection of the precast member by effects of temperature change, shearing or plastic flow in the concrete or steel.

With precast structures, the practice of placing framing members in a sort of post-and-lintel construction, with either no ties or token ties, is at best a make-shift arrangement. During recent years there has been too great an advance in the design of continuous and rigid-frame structures and monolithic construction for us now to go back to post-and-lintel construction. Precast products can be designed for full continuity for either dead or live load or both. The result is a more stable and economical structure if the details are properly executed.

ROSS H. BRYAN
Consulting Engineer
Nashville, Tenn.

More On Toronto Collapse

SIR—Subsequent discussion (ENR Oct. 30, 1958, p. 8 and Dec. 25, 1958, p. 8) of the collapse of the Union Carbide building in Toronto (ENR Sept. 11, 1958, p. 27) indicates that limberness of the horizontal framing may have contributed to the collapse, particularly where side sway was resisted only by the frame.

When axially loaded compression members are subjected also to bending, stresses and strains due to bending are magnified. The magnification factor is a function of the ratio of the axial load to the Euler critical load.

Taking a typical beam-to-column moment connection of a frame under lateral load, magnification factor is:

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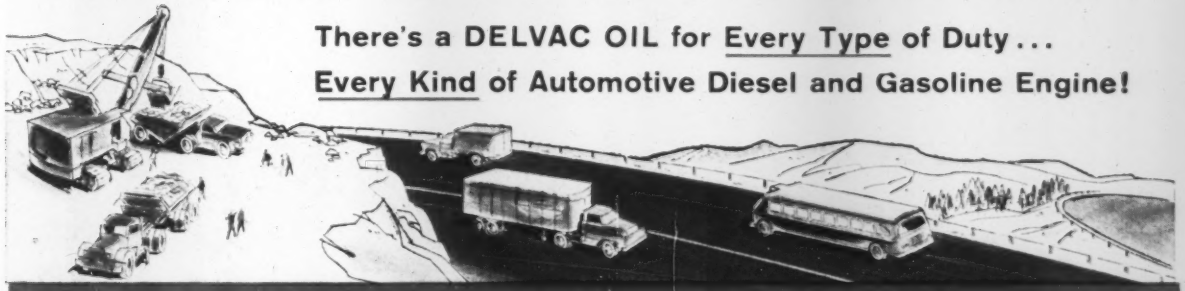

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DELVAC OIL S 200 SERIES	For Caterpillar and other diesel engines requiring a Series 3 oil for extreme, heavy-duty conditions; ideal for mixed fleets equipped with various diesel and gasoline engines.	**Two Grades** — Delvac Oil S 210 (SAE 10W-20); Delvac Oil S 230 (SAE 30)	API Service Classification: **DS**
DELVAC OIL S 100 SERIES	For diesel and gasoline engines requiring Supplement 1 detergent-dispersive characteristics; heavy-duty performance level between Delvac Oil S 200 Series and Delvac Oil 900 Series.	**Two Grades** — Delvac Oil S 110 (SAE 10W-20); Delvac Oil S 130 (SAE 30)	API Service Classification: **DM**
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100

. . . Reader Comment

load, l and h are respectively the span and story height, a is the square root of the ratio of P to Euler critical column load (π^2EI/h^2), and I_B is the aggregate moment of inertia for the horizontal members per column member at the connection. We assume that points of inflection occur at the midpoints of the members; for location elsewhere, l and and h need adjustment.

For convenience, the expression is indicated as three bracketed factors. The third bracket is the basis for the secant column formula. The second bracket is the modification of the secant formula because the bending moment diagram for the column before distortion is triangular instead of rectangular. The first bracket represents the further modification because the horizontal members have limberness.

This first bracket represents an independent source of instability, since the second term in the denominator approaches unity. It shows that the horizontal members must be comparable in stiffness to adjacent columns.

Other lateral-distortion conditions may be handled similarly. Under the assumed conditions leading to the secant column formula (displacement of column load from axis before distortion a constant amount, say 25% of the kern distance), the magnification Q is the product of the first and third brackets. Also, under the basic conditions leading to the sinusoidal column formula (displacement varies as a sine curve) the magnification is the product of the first bracket and the expression $1/(1-a^2)$ (sinusoidal column factor).

In general, the unit drift (inches of lateral movement per inch of height) is equal to $Q-1$ times the column moment at the connection before distortion, divided by the product of the column load and the distance from the connection to the column inflection point.

HERMAN F. FINCH
Structural Engineer
WILLIAM P. FINCH
Univ. of Calif., 1960
Sacramento, Calif.

For Your Calendar . . .

21st Annual American Power Conference, Hotel Sherman, Chicago, Ill., Mar. 31-Apr. 2.

8th Southern Municipal and Industrial Waste Conference, University of North Carolina in Chapel Hill, Apr. 2-3.

8th Annual Meeting of the Building Research Institute, Penn-Sheraton Hotel, Pittsburgh, Pa., Apr. 6-8.

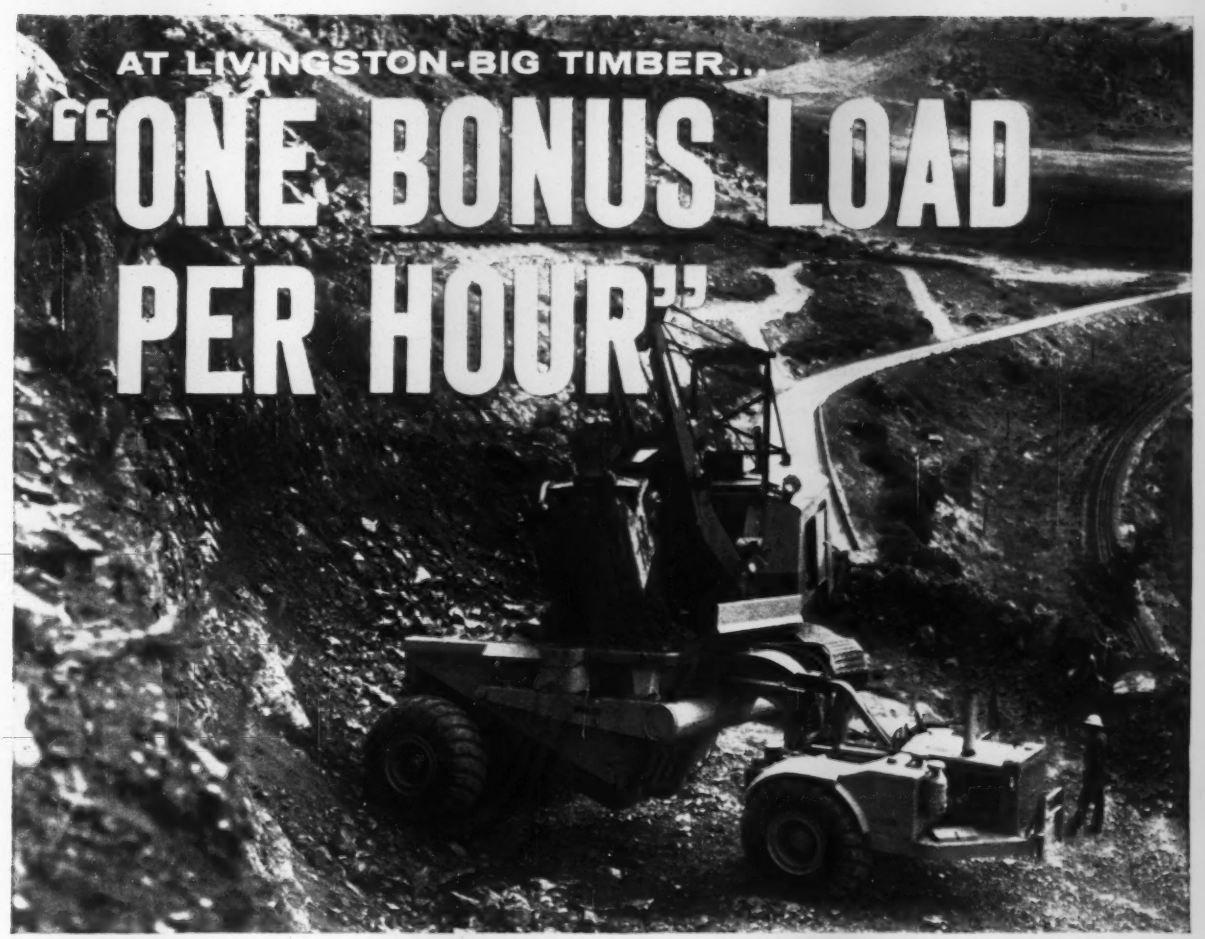
National Industrial Conference Board's Seventh Atomic Energy in Industry Meeting, Statler Hilton Hotel, Cleveland, Ohio, Apr. 8-10.

Wisconsin Triennial Engineering Exposition, University of Wisconsin, College of Engineering, Madison, Wis., Apr. 10-12.

National Association of Architectural Metal Manufacturers, Monteleone Hotel, New Orleans, La., Apr. 12-17.

New York's 29th Annual Safety Convention and Exposition, Hotel Statler, New York City, Apr. 13.

Automotive Engineers 10th Annual Earthmoving Industry Conference, Pere Marquette Hotel, Peoria, Ill., Apr. 14-15.



In tough hauling territory, Athey PR21's net a standard extra load per hour. Says contractor Jay Lalonde: "Our operation was faster, more productive than our estimates."

On the Livingston-Big Timber section of U. S. #10 highway, Montana, —hauls were steep, working room cramped. Yet the Athey rear dump trailer units gave higher production than the most hopeful estimates. In cramped quarters, PR21 executed 90° turns, actually whirled into place. Big rocks? The PR21 body provided a big easy shovel target. Steep tricky hauls? With its low center of gravity, PR21 operated with full 22.5-yd. loads at speeds up to 27.9 mph. As a result, each of the three PR21's gave *a bonus load an hour* on the 900-ft. hauls! Get more "haul" for *your* dollar—see your Athey-Caterpillar dealer—or write direct for free booklet.

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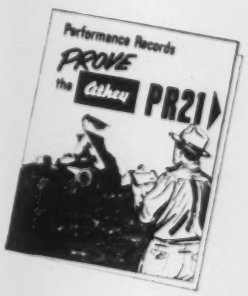

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ENGINEERING NEWS-RECORD

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Back issues of ENGINEERING NEWS-RECORD *are generally available for the previous six months. Semi-annual indexes will be sent on request.* ENGINEERING NEWS-RECORD *is also indexed in Industrial Arts Index and Engineering Index.*

THE CONSTRUCTION WEEK

ALUMINUM BRIDGE FOR RUSSIA—The Soviet Union says it will use helicopters to assemble its first all-aluminum bridge—a test model.

MONORAIL FOR BRITAIN—The British are about to put down a test track for a monorail system at Basildon, Essex. The single rail for an 80-mph carrier will be of concrete.

BETTER BUSINESS—Heavy construction contracts this month racked up the second largest volume since last July. This is the second highest March on record. First quarter total is $4.6 billion, 20% above a year ago.

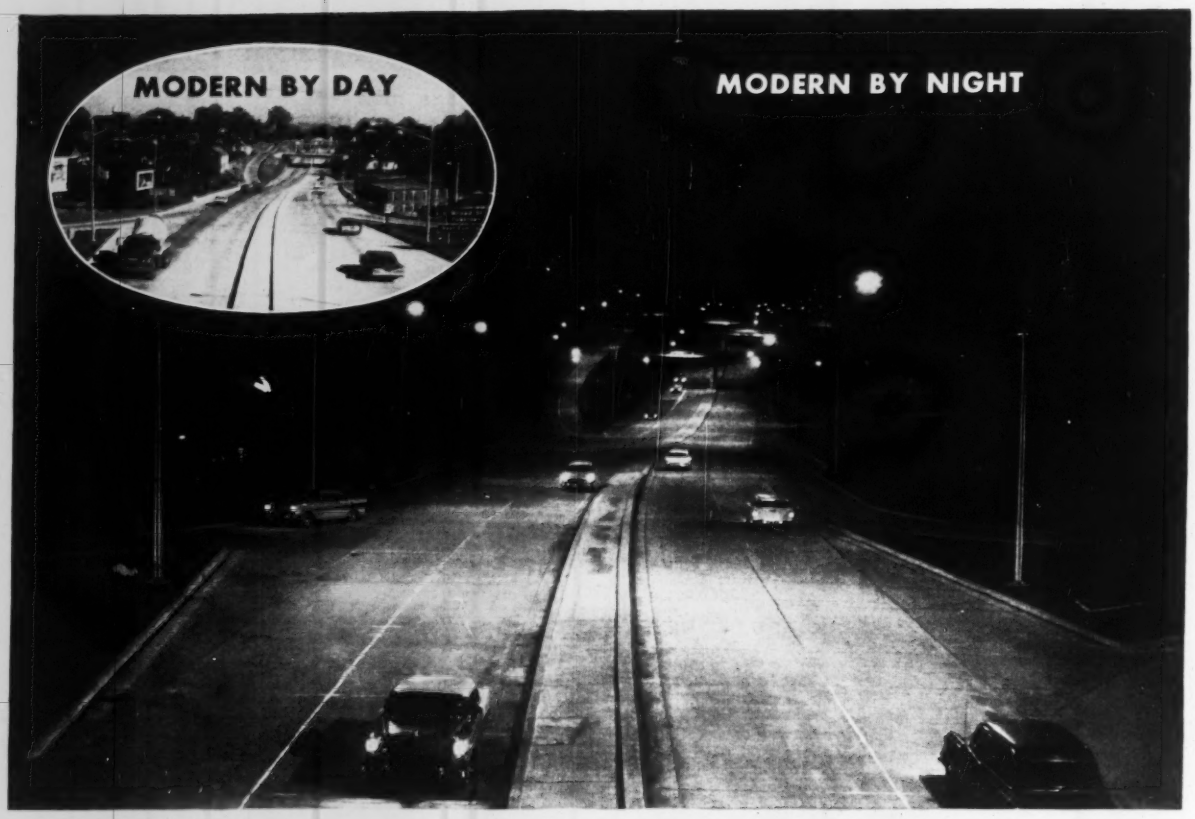
SAFETY MEANS CONTRACTS—Compliance with the highway department's safety program will be a big factor in obtaining a contract for road projects in Michigan. Contractors must now submit a job safety program for the department's approval. They must also keep detailed accident records during the work. Utah has a similar program (ENR Jan. 8, p. 111). Michigan officials estimate that highway construction accidents cost $31,000 per million dollars worth of construction.

BRIDGE APPROACH BELTED—That much-disputed Seventh Avenue Brooklyn approach to the Narrows Bridge is in trouble again. The New York State legislature last week passed a bill requiring a different approach—following Brooklyn's Belt Parkway. New York City's Board of Estimate had approved the Seventh Avenue system (ENR Jan. 8, p. 24). The hot potato is now in Gov. Nelson Rockefeller's lap.

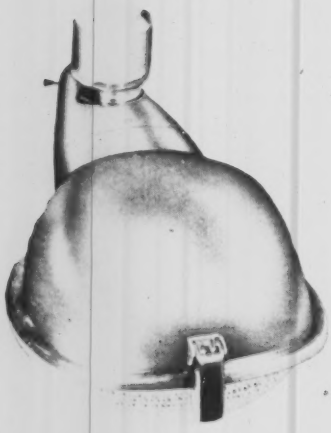
SAME JOB, NEW TITLE—Air Force "installations" offices and officers are now "civil engineering" offices and officers. One reason: To make it clear that the Air Force has a civil engineering staff of its own.

IJC PLAN NOT THE END-ALL—Present U.S. plans for Columbia Basin development must go ahead even if the U.S. and Canada adopt measures recommended by the International Joint Commission (see p. 27). To cut peak flow at The Dalles to the short-term flood control goal of 800,000 cu ft per sec, projects south of the border must still attain 20 million acre-ft of storage capacity. This is seven or eight million more than the capacity of works now existing or definitely planned.

BUY AMERICAN OR ELSE—The Texas legislature is considering a "Buy American" bill with teeth. It would grant state agencies the right to ban use of imported materials on any type of state construction. Under the measure, a contractor who used foreign materials in the face of an agency prohibition would be barred from further state work for three years.



Modern light on Winston-Salem Interstate link makes nighttime driving as safe as daytime



North Carolina's first Interstate mileage—a 3.1-mile stretch of Route 40 opened in Winston-Salem more than a year ago—is lighted for its entire length. In specifying modern roadway lighting, North Carolina Highway Engineers made the "Winston-Salem Expressway" as safe, convenient, and efficient a traffic carrier by night as it is by day. This is an opportunity —and challenge—open to every state.

America's annual nighttime traffic toll adds up to 20,000 deaths—nearly a million injured—close to two-billion dollars in cost to business and individuals. Experts agree that such slaughter and economic waste can be *cut in half* by modern roadway lighting.

And it isn't necessary to light every mile of roadway! The job can be done by concentrating on *seven deadly areas of driver decision:* entrances and exits, bridges and viaducts, intersections, underpasses and tunnels, interchanges, guide-sign locations, and heavily travelled stretches. Cost of such lighting is low—on the average close to 1% of total highway cost. Operation runs less than grass cutting and similar day-to-day maintenance.

Measured in terms of human safety, driver convenience, and traffic-carrying efficiency, a new highway without proper lighting is out of date the day it is opened. Make sure that all new highway mileage in your state is up-to-the-minute—by night as well as by day! General Electric Co., Outdoor Lighting Dept., Hendersonville, N. C. 450-9

AMERICA'S LEADING LINE of highway lighting equipment is ready to help you cut our nighttime traffic toll. Count, too, on expert application help from G-E lighting engineers at your nearby G-E Apparatus Sales Office.

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WASHINGTON OBSERVER

- **Defense construction: Going underground**
- **Dim prospects for pension plan**
- **Transit routes can't have road money**
- **Spotlight on 'administered prices'**

● **New military stress on underground construction of key facilities was underscored again last week.** The Pentagon selected a mountain site near Colorado Springs, Colo., as a new underground combat operations center for the North American Air Defense Command (NORAD).

The structure will cost roughly $25 million. Invitations to bid on the project are still some six months off.

The Air Force is now seeking approval to install future Atlas ICBM units in hardened underground sites—with 13-story-deep launching pits or silos. The earliest of the nine scheduled Atlas ICBM squadrons will use soft surface installations. The 11 scheduled Titan ICBM squadrons will be underground.

—

● **Self-employed pension schemes will not survive in this Congress.** Don't be misled by House passage of a bill to permit tax deductions on up to $2,500 a year for self-employed engineers, consultants and the like.

The Senate Finance Committee will hold hearings somewhat reluctantly, on the bill later in the session. Odds are it will be voted out. But chances are it will be broadened on the floor to let all taxpayers deduct payments for personal retirement programs. That would cost $3 billion a year in Treasury revenues and would make a Presidential veto just that much more certain.

—

● **Federal highway funds can't be used to buy enough right-of-way to take care of rapid transit lines too.** The Bureau of Public Roads will consider including transit routes inside the boundaries of the right-of-way—but only if they don't conflict with highway design, and only if transit land is paid for with nonfederal funds.

Newspaper accounts to the contrary misinterpreted the position of Public Roads Commisssioner Ellis Armstrong in a talk to the Urban County Conference of the National Association of County Officials.

——

● **Construction materials and machinery are right in the political fight now boiling around prices and inflation**

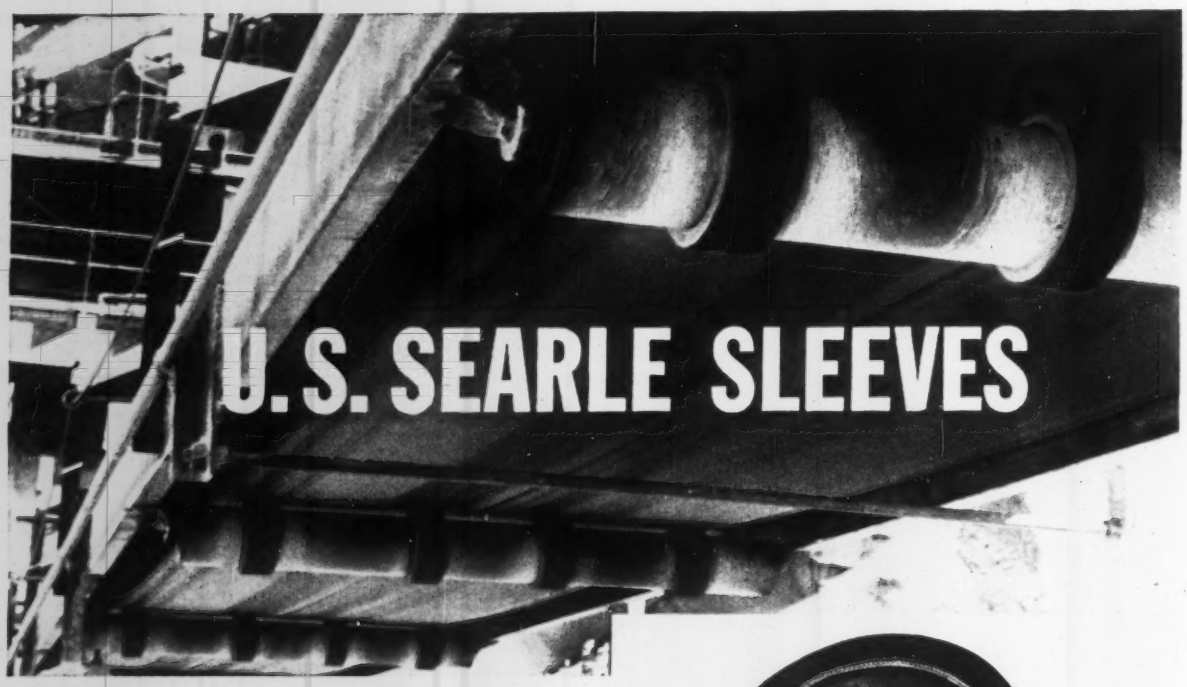
Vice President Nixon, who is heading President Eisenhower's big anti-inflation study, is particularly interested in the construction industry. Sen. Paul Douglas (D., Ill.) is spearheading the Democratic efforts on Capitol Hill.

Prices have become a hot topic in Washington in the past couple of weeks, sparked by an analysis of administered prices by economist Gardiner Means. Mr. Means showed a series of charts to Congress to back his views that recent inflation has been casued mostly by increases in "administered price" industries—including construction machinery and such materials as steel, asphalt, flat glass, gypsum and structural clay products.

The Federal Reserve Board, in a surprising switch, acknowledged that it does not have the weapons to stop administered price inflation. President Eisenhower's top economic advisers say administered pricing holds down business expansion and causes unemployment.

SEARLE SLEEVES

The patented proven way to prolong conveyor belt life!



The patented Searle Sleeves are made of abrasion-resistant cushion rubber reinforced by heavy belt duck. Installation is fast, just slip them over the idler rolls. At impact points, cementing is recommended.

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Consultants Will Add to Their Staffs by Summer:

(An ENR survey of 252 firms)

	Now	Summer	
New England	2,084	2,264	up 8%
Mid Atlantic	3,054	3,286	up 8%
South	1,152	1,242	up 8%
Mid West	2,690	2,883	up 7%
West of Mississippi	2,915	3,001	up 3%
Far West	1,334	1,480	up 11%
...and for the nation	13,646	14,625	up 7%

More Jobs for Engineers Coming

Engineers looking for jobs with consulting firms should have better luck in the months ahead. They've had slim pickings in the months just past.

Consulting firms—the most sensitive indicators of engineering activity in construction—are stepping up their hiring, starting this month. By June their staffs will be 7% bigger than they were in February (see chart above).

An ENR survey of 252 consultants indicates these firms had 13,646 engineers on their payrolls last month. They hope to increase this to 14,625 by July. Half the firms surveyed plan to increase their staff, 7% will cut and 42% expect to stabilize at the February level.

The improved job outlook is a reflection of the upturn in new business that began last September. New business is now flowing into consultants offices at about double the August rate, but it is spotty for individual firms and varies for different areas of the country.

Consultants in the Far West, for example, expect to have 11% larger staffs by June; those West of the Mississippi will get only 3% more help—but the dropoff there was slight. Consultants in New England, the Mid-Atlantic states and the South will up their staffs by 8% and in the Midwest, staffs will grow 7%.

It adds up to good news for civil engineers.

There has been ample evidence of unemployment among engineers in the big metropolitan areas in recent months. And there is reason to believe a slowdown in activity among consulting firms was the cause of it. (Contractors generally do not employ as many engineers as do consultants; government agencies, which employ a large share of construction's engineers, maintain a fairly stable work force. It is the consulting firms that make the sharp changes in staff size.)

Figures from state and private employment agencies in New York, Chicago and San Francisco last month indicated job openings for civil engineers had fallen off.

Paradoxically, the U. S. Bureau of Employment Services at the same time indicated there were 827 civil engineering jobs open. That is, it recorded that many openings listed by state employment agencies for employers willing to recruit outside their own state.

How could 827 openings for civil engineers exist side-by-side with unemployment in the big metropolitan areas? One employment agency man explains it this way. The jobs to be filled aren't attractive enough to make an unemployed engineer relocate; he'd rather stay unemployed for a while and go back to work at his accustomed salary in his own area.

This, then, was the situation when ENR started its survey: Unemployment among engineers in the places where consultants congregate; jobs going begging in places, or at salaries, that could not attract even the unemployed.

The fact that the consultants surveyed foresee increasing business that will require a 7% staff increase bodes well for employment of engineers in all of construction. The nearly 2,000 engineers these employers will add will produce the plans for construction that other engineers will have to lay out and manage for contractors, supervise for owners and supply for manufacturers.

Increased activity in consulting of-

fices indicates future activity all along the line—jobs for engineers both in field and office.

Collectively, but not simultaneously, the firms surveyed have employed as many as 17,467 and as few as 9,862 engineers in the years since 1952. That is, if each firm were now at its peak of employment during the last seven years: 17,467 engineers would be employed; if each were at its minimum, 9,862 would be employed.

Actually, maximum employment by some firms coincides with minimum employment by others, as hiring and firing can cancel each other out. The consultants' employment figures do make it clear that the employment picture was relatively good in 1956, '57 and the first part of '58; not so good in '54, '55, the latter part of '58 and the start of this year.

To blame for the recent slump in employment was the '57-'58 downturn in industrial building, the survey indicates.

One-third of the consultants surveyed look to private sources for more than half their work. This includes slightly less than one-third of all firms

. . . How Consultants View the Outlook

Optimism, pessimism, uncertainty —those three attitudes are all represented in the responses to ENR's survey of 252 consulting engineering firms (see story on p. 21). Here are some excerpts from consultants' comments about the business and engineering employment outlook.

Boston—Very optimistic . . . Private work should increase and public works should stay about the same . . . Does not look good . . . Poor at present but will undoubtedly improve . . . Good. All indications for upswing to carry through next eight or 10 months . . . Have been quite slow for past eight months . . . Distant future is encouraging.

New York City—Depends on federal government's working out expeditiously the trust fund deficiency for financing the Interstate highway program . . . Pessimistic, worst in 13 years . . . Very good for 1959, uncertain for 1960 . . . Commercial building still looks good.

Philadelphia—Fair . . . Date of starting many projects is so uncertain, that delays might cause cutting of staff . . . We have all the work we can possibly handle at this time. Also many projects planned to mature in 1959, but not yet active design stage . . . We expect a 30% to 50% increase over 1958.

Pittsburgh—Good, our backlog presently provides for about 18 months . . . Prospects are much more active and many are ready to proceed with work . . . We see no letup in our business . . . Generally good.

Baltimore—We do not expect much change from our average . . . Outlook for this firm is good. Engineering now in progress and contemplated in future assignments will carry firm for two years at present level.

Miami—Steady, anticipate no great change . . . Does not appear favorable for increase over past year, particularly in highway work . . . Additional commercial and industrial construction locally should increase our work load appreciably.

Cincinnati—Too heavily weighted by public works projects . . . Improving steadily . . . Not rosy on industrial.

Cleveland—Business has held up well to date but the jobs are smaller, outlook and current backlog poor . . . Several large projects that had been postponed promise to move ahead this summer . . . Private is down, outlook uncertain.

Columbus—Excellent . . . Highway work is decreasing, sewerage and waterworks are about the same. Subdivision, new development, decrease . . . No rise in industrial expansion expected . . . Many large industries are pessimistic. Some are moving to other countries.

Indianapolis—Encouraging but little concrete evidence . . . Fair . . . Very good . . . We anticipate a slow-up trend for next 15 months.

Chicago—The outlook does not seem unfavorable. One basic reason is that waterworks and sewage treatment are less subject to business fluctuation than many other branches of engineering.

Detroit—Tight until late May or June, then slowly rising construction economy, peaking in 1960 . . . Our integrated firm has a highly diversified clientele. Industrial activity very slow for next four to six months. Government (all) seems steady, institutional seems to be steadily increasing. This year is running substantially ahead of the same period of 1958. If the curve continues, which seems likely, 1959 should be one of our better years . . . Projects lag in the formative stage, are considered, budgeted, suspended, reactivated: It is a sign of doubt.

Minneapolis-St. Paul—Good . . . New work at present is slow in coming . . . Very good around here . . . Booked solid for 1959 . . . I look for public works to increase about 5% and hold for 10 years in waterworks and sewerage.

Kansas City—Perhaps more work . . . Process industry work still remains dormant, no sure sign of a marked upturn . . . Outlook favorable . . . Though we do not have the backlog volume of work we had a year or so ago, we are busy.

St. Louis—Good . . . We believe the outlook is very good . . . Good . . . Excellent . . . Very good.

Houston—Prospects look very bright indeed—much, much improved over 1958 . . . Continue at present level with fair possibility of starting to increase by mid-1959.

San Antonio—Lots of yak, not much definite . . . Considerable lag in private engineering work in last two months and I expect it to continue through the summer. Most engineering work going on here is highway department or Army or airport.

Los Angeles—During the latter half of 1959 our business will increase considerably . . . Better than 1958 . . . Prospects for 1959 look excellent . . .

San Francisco—Good, but it's a period of competition and survival; quality and value will be important, also attitude. Prospects look very good, particularly in traffic and hydroelectric fields . . . Expect drop in construction except in highways and missile work.

adding to staff, only a quarter of the firms stabilizing their employment and a full half of the few firms cutting staff.

This picture may change. Industrial building is making earlier and stronger gains than expected (ENR Jan. 15, p. 21).

Private work as a percent of the consultant's work load varies across the country. In New England it is 27%; in the Mid-Atlantic states, 48%; in the South it's 29%; in the Midwest, 39%; West of the Mississippi, 24%; and in the Far West, 31%.

How much business could consultants handle with present staffs? That's hard to say. Answers to that question range from $100,000 per man per year, to $6 million per man per year. ("It depends on the type of work," one consultant observes.) But 70% of the answers clustered between $100,000 and $750,000 per man per year and 30% were near the center of that range—$250,000 to $500,000 per man per year.

These figures mean that each increase of $500,000 over the current rate of new business should open up at least one new job.

Why doesn't re-employment turn up as fast as new business?

A Houston consultant answers that question this way: "We are becoming more efficient, more work done per man, hence, more salary per man."

Agency Specializes in Jobs For Construction Execs

Looking for a new job? Or for an executive for your firm?

A major employment agency based in Chicago has organized a division dealing exclusively in the executive requirements of construction.

Cadillac Associates, Inc., now has job listings ranging from $8,000 to $40,000 a year for civil engineers, construction managers, architects and structural engineers.

The agency provides a monthly publication for companies in the market for talent (price: $45 a year). For job hunters, the agency has a monthly publication describing job openings (price: $6.50 a year, $1 a copy).

C. R. Logsdon, director of the engineering placement division, says it has a mailing list of about 12,000 civil engineers, 12,000 architects and 7,000 architect-engineers. The employers' bulletin goes to approximately 7,000 architectural firms and 7,300 construction companies in the U. S.

Positions open and listed now include one for president of a Wisconsin construction company, $40,000 annually; project manager for power plants construction in Minnesota, $12,000, plus bonus; project managers for oil refineries in Europe, the Middle East and South America, $20,000 to $30,000.

Iraq Ousts US Engineering Firm

Iraqi authorities last week closed the Baghdad office of Tippetts-Abbett-McCarthy-Stratton, New York City consulting engineers.

A proclamation by Iraq's military governor-general, Brigadier Ahmed Saleh el-Abdi, said:

"Following the termination by the Development Board of the contract of Tippetts-Abbett-McCarthy-Stratton, consulting engineers, due to the company's violations, all its offices and stores have been placed under control. This is to prepare the inventory of the office and stores and settle the accounts."

No further explanation was forthcoming. However, an official of the firm in New York says he had heard through various sources that one of the alleged violations was "not keeping our accounts correctly."

The company spokesman denies this saying "we may not have them in the exact physical form they wanted, but our records were certainly complete, carefully maintained and accurate."

It was also reported that the government is "dissatisfied with technical performance." The firm's spokesman says this is contrary to recent facts. "Only last February 26, we submitted revised proposals to the Development Board at its request."

It is known that the Iraqi government has been negotiating economic and technical assistance pacts with Moscow. These negotiations could possibly involve water development projects, the type of work handled since 1952 by the engineering firm.

"We are interested in getting our employees out of the country safely and obtaining the considerable amounts of money due us—in that order," says the official.

The firm employed 18 Americans—some with families—10 Greek nationals and five other Europeans at the Iraq office. Three Americans have already left the country and others are expected to leave shortly.

TVA Backs Flood-Plain Zoning

Local zoning controls should be made a prerequisite for federal flood protection projects. That's the major recommendation in a report submitted to Congress last week by the Tennessee Valley Authority.

To back up this advice, the report cites a successful six-year experiment in the Tennessee Valley.

TVA's recommendations are similar to those made last December by the Council of State Governments.

Prime objective of the TVA plan is to prevent new construction on frequently flooded lands on the theory that "an ounce of prevention is worth a pound of cure."

The increasing urban population of the country is spreading into lands exposed to flood damage. This, TVA points out, raises the value of exposed property and increases the amount of dollar damage done by floods despite the millions in federal money being spent to protect existing property within flood control areas.

Annual flood damage in the U. S. has increased every year for the last 50 years, TVA notes. It has doubled over the last 25 years.

TVA recommends that state and local zoning ordinances be based on flood studies, which could be prepared by the federal government on request. Federal flood protection would, in turn, be made contingent on local plans and zoning controls.

In its own region, TVA has cooperated with local communities since 1953 by providing technical assistance for flood-plain planning upon request, the report states. More than 50 communities in five states have asked TVA for this kind of help through their state planning agencies. TVA has completed some 35 flood reports for individual communities.

With the help of TVA reports, state and local planning bodies have turned out complete flood-plain studies for ten communities. Six of the cities have officially adopted flood-plain zoning.

Flood planning studies resulting from this cooperative effort usually lead to a proposal for a floodway within the community from which new construction of obstacles to high-water flows would be barred. Permissible uses of land inside the floodway may include parking lots, outdoor theaters and similar facilities not vulnerable to severe flood damage. Buildings along floodway fringe areas would have to conform to floor level requirements above flood stage.

TVA's report to Congress adds punch to the recommendations that came out of the conference co-sponsored by the Council of State Governments and the American Society of Civil Engineers at the University of Chicago last December.

Strongest of the states' proposals is a statement urging that future federal-local flood-protection projects be made contingent on action by state and local governments to prevent further encroachment on floodways.

After Years of Talk: Help for

- **But whatever money Congress finally votes will not be translated into construction contracts immediately.**
- **Despite all the talk about federal aid, the areas to be helped don't know yet how they will spend the money.**

"The area redevelopment bill is not a magic wand that will bring prosperity. It won't even do all the things that some of its sponsors claim. But it is a bold beginning."

The speaker is Rep. Ken Hechler of West Virginia's 4th District, a first-term Democratic Congressman who spends most of his waking hours trying to get something done for his unemployed constituents. There are many other Congressmen in the same worrisome fix, and most of them are working tooth and nail for passage of area redevelopment legislation aimed at relieving unemployment in depressed areas.

Odds are they will succeed, and fairly soon. Despite admitted shortcomings, the concept of area redevelopment rates is the best that politicians have yet devised for dealing with the many facets of one key problem: What should the federal government do to wipe out the pockets of chronic, lingering unemployment?

Economists and politicians have long argued about what can be done, but the Chamber of Commerce of the United States and the National Association of Manufacturers are the only organizations that say the federal government should do nothing.

The Administration accepts the principle of federal aid—in the form of a $50-million revolving loan fund—for area redevelopment.

Congress, with Republicans and Democrats alike behind the push, is set to pass a bill more than seven times bigger—a $389-million package. President Eisenhower vetoed an identical bill last fall. Whether he will sign this year is a big question, but the implied veto threat is taking no steam out of the bipartisan Congressional drive. The Senate this week put the legislation on its way to the President.

Congressional Democrats believe area unemployment has become such an emotional problem that the President will have to acknowledge it. Already, Congress is putting through legislation temporarily extending federal payments for the jobless who have exhausted state benefits.

The $397-million depressed areas legislation probably will be trimmed before it gets to the White House.

A depressed area, generally, is a city, county or region whose unemployment for a continuing period runs from 6% of the labor available up to 15%.

What is ironic today about those areas suffering depression in the midst of general business recovery is this:

Morgantown, W. Va., and other depressed cities do not now know what to do with federal aid when it comes. Congressmen and officials from areas of heavy unemployment can give little information about what they would do.

It is startling that depressed areas legislation, proposed by both Republicans and Democrats for the last half-dozen years or more, has not stimulated some ready plans in Wilkes Barre, Scranton, Morgantown, Fall River, Lowell or even Detroit.

This means that whatever construction plans result from depressed areas legislation will be some time coming.

• **Why they want it**—Representative Hechler says candidly, "I'm sure it would be a year, or probably longer, before this bill could bear any fruit. But that's only a reason for getting started now. One can hardly help but wonder what the situation might be now if there had been such legislation a few years back—say five years ago."

The President's veto of the 1958 area redevelopment bill was one of Representative Hechler's big campaign issues in his upset victory last fall.

His district is in deep trouble. It covers two counties and curves along the Ohio River.

Its misfortunes are almost a classic example of why a depressed area gets that way: Coal sales declining and mines undergoing mechanization, throwing the miner out of work; railroad repair and maintenance jobs shrinking more each year; and the unhappy homecoming of West Virginians, jobless, from other states where they have been squeezed out of auto or steel jobs.

• **What's in the bill**—Those closest to the problem place heavy store on one of the least publicized features of the bills now being shepherded through Congress by Sen. Paul H. Douglas (D., Ill.) and Rep. Brent Spence (D., Ky.). That is a provision authorizing up to $4.5 million a year for technical assistance to the depressed area. This money would underwrite surveys of the area's potential—its natural resources, the size of its labor force and the present skills, its transportation facilities, etc.—and plans for cashing in on the potential through industrial development.

Financially, most of the area rede-

Here's Why

The nation is up against its most serious unemployment problem since New Deal days. In a period of increasing production, 4.75 million workers don't have jobs.

Construction leads the parade, with 22% of all construction workers unemployed in February. That's about what it was in February 1958, during the worst stage of the recession.

But construction unemployment is seasonal and good weather is bound to bring an improvement.

For the nation as a whole, the problem is likely to continue despite spring thaws and a continued business upturn.

The reasons for unemployment are a mixture of old and new. The combination has swamped the forces of a strong business recovery that normally would have put a large part of the unemployed back to work.

Chronic factors, especially the disappearance of job opportunities in depressed areas, have created a big hard core of 600,000-800,000 unemployed (see story above). New England textile towns and the Eastern Pennsylvania hard coal area have known this problem for several years.

The recession has left some new "sick industries" that have yet to feel any strong revival of consumer demand. The slow recovery in auto sales has made Detroit one of the worst centers of unemployment. Consumers are also holding back on spending for appliances and other durable goods, although sales

Depressed Areas Is Coming

velopment emphasis goes to loans. The legislation would provide $10 million a year for re-training of unemployed workers in skills needed to fit into jobs promised as a result of redevelopment, and it carries a one-shot, $75-million authorization for outright grants to utterly destitute communities needing to build public facilities—waterworks, industrial parks, sewerage systems, roadways—necessary to attract industry.

But the bulk of the legislation is in three separate $100-million revolving loan funds, and most eligible areas would have to take their federal assistance through them. One of the funds is for rural areas needing light industrial development to relieve absolute dependency on substandard agriculture.

The other two funds of $100 million each are for lending to benefit cities and towns. One is earmarked for construction of public facilities, with federal participation ranging up to 65% for terms as long as 40 years and at rates one-fourth percent above the Treasury Department's borrowing cost. Loans from the other fund could be obtained by private business enterprises for new or expanded facilities, including purchase of machinery and equipment, under identical conditions, except that the maximum term would be 30 years.

Says one of Senator Douglas' aides: "What this bill really means is that the federal government takes some responsibility, that some of these communities will get some 'seed' money, and that we're moving into an area concept. And that is important. One area development might help to solve the problems of several communities."

West Virginia's new Democratic Senator, Robert Byrd, says that "seed" money is important. "The most immediate effect of this kind of legislation will be to stimulate the hopes of our people—and they need that," he says.

Low-interest, long-term risk capital may be the most important element in any depressed area's recovery. Senator Byrd thinks: "In my own state, there's not a single $100-million bank, and 80% of the banks have total resources of $5 million or less. This sort of situation makes it virtually impossible to raise risk money."

Area redevelopment, then, is a long-range program designed to stimulate economic recovery. There is some slight direct pump-priming in it—notably, the $75 million in direct grants for public facilities—but even this would be slow getting into the pipeline. It would depend on an area's preparation of adequate plans, which then would have to run the bureaucratic gamut in Washington.

Even assuming full speed, no community could hope for much assistance under such legislation within 18 months.

There's So Much Unemployment

are robust in housing, nondurable goods and consumer services.

The sharp cutback in capital spending is only slowly being reversed. This is holding down employment in machinery and in industrial construction. Capital spending dipped from $37 billion in 1957 to $30.5 billion last year, and present plans call for a return to only $32 billion this year.

Much of the rise in production so far has been achieved by having present workers put in longer hours—the average rose from 38.3 hours per week in manufacturing last April to about 40 in the last few months—rather than by hiring new workers. Employers, who have gotten rid of inefficient and unnecessary workers, try to avoid taking on "dead wood" again.

Productivity is probably the most talked about reason for the persistence of unemployment. Productivity has been rising at an almost phenomenal rate since last spring. Estimates run as high as 7% to 8% per manhour. This stems from the investments in new plant and equipment during recent years. The result is that manufacturing industries were able to produce as much in February 1959 as they did two years earlier—but with 1.2 million fewer workers.

A new factor raised in government circles is the possibility that big business pricing decisions have contributed to joblessness. In a surprising switch, top economic officials of the Administration and the Federal Reserve Board have accused "administered price" industries of setting their prices so high that they have choked off demand. They have pinpointed steel and auto companies in their charges.

A breakdown of the 4.75 million unemployed in February helps bring more clearly into focus just who they are. Just under 30% were male adults in their prime years (25 to 44), and another 20% were men of 45 to 64 years. Married men of all ages accounted for 41% of the total unemployed, down slightly from 43% a year ago.

By industry, the biggest single slice of unemployed was in construction—some 18%. Seasonal factors are chiefly responsible. But another reason is that there has been an increase in the number of men looking for work in construction, because they feel opportunities are better than in manufacturing and transportation industries. (For the employment outlook for civil engineers, see p. 21.)

The durable goods industries—principally steel and auto workers—account for the next largest portion of unemployed, 17.5%. The nondurable goods industries, which were not so hard hit in the recession, account for only 10%.

As of now, there is little question that unemployment is one of the nation's most serious economic and political problems. The main doubts are about how long it will continue to be a major problem.

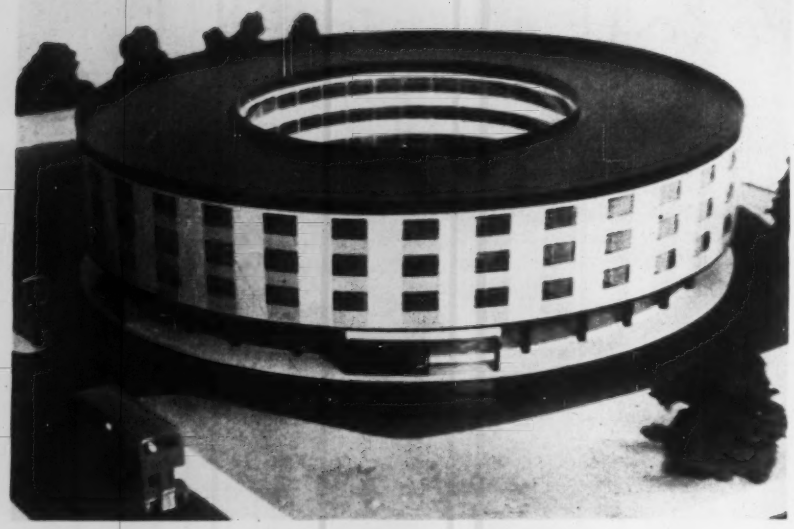
Some government experts are predicting the number of jobless workers will drop substantially as the business recovery picks up steam.

Many economists outside of government, however, expect unemployment to remain large for the rest of the year at least, and maybe longer.

The facts are clear that automation and other technological advances have shrunk job opportunities in some major industries. In manufacturing, despite record output in the boom years 1955-1957, employment never got back to the level it reached in 1953. And employment in contract construction, which peaked at an average of 2.9 million in 1956, averaged only 2.65 million last year on about the same physical volume of work.

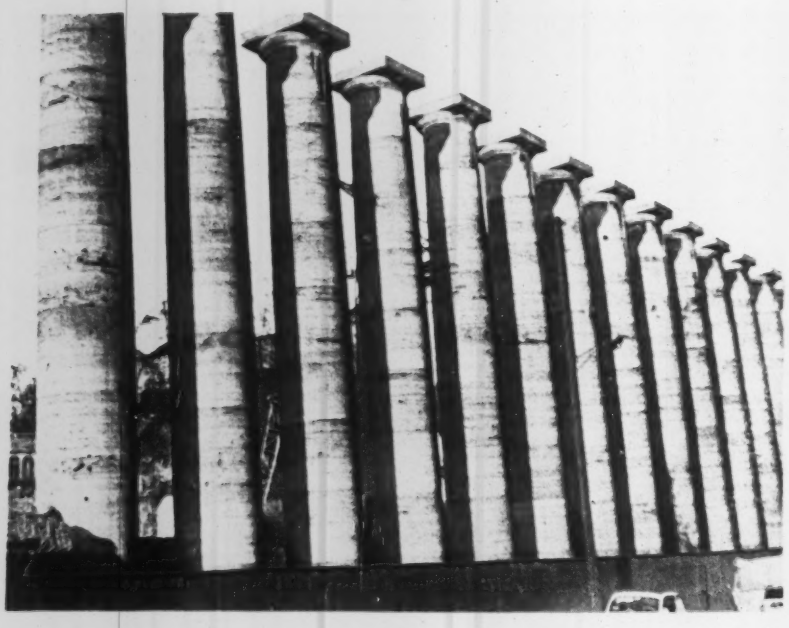
It all comes down to a question of whether the economy can provide more jobs for an increasing labor force, either through an exceptionally strong rise in manufacturing and construction or through expansion of opportunities in other fields. In recent years, the increase in jobs has come in retail and wholesale trade, in the service industries and in government employment.

Actually, there were 734,000 more persons with jobs in February than there were a year earlier. So the economy is providing new jobs. But it will have to meet a formidable challenge later this spring when June graduations will add close to a million new workers to the labor force.



What's Around in Hotels?

Work will start in May on Europe's first circular hotel near London Airport. The doughnut-shaped building, 176 ft in diameter, will be framed in reinforced concrete and stand four stories high. The center court will be 88 ft in diameter. Because it's close to the airport, all 185 rooms will be completely soundproofed. J. Lyons and Co., Ltd., with Watney Mann, Ltd., are the builders. P. R. Diplock of London is the architect; Taylor Woodrow and Co., Ltd., is the general contractor. The project will cost $1.4 million.



Need Some Surplus Columns?

Adolf Hitler ordered these columns nearly 20 years ago as a gift to his friend Mussolini. Then things changed and the owner neither paid for nor picked up his order. But the builder, Firma Sandsteiwerke of Stuttgart-Muenster, Germany, still hopes someone can use the columns.

There's 'Gold' in Meadows If Dam Plan Pans Out

Dutch engineers last week submitted a $15-million plan calling for a tidal barrier and system of levees as the first step in the reclamation of 15,000 acres of the New Jersey Meadows—a 30,000-acre marshland within seeing distance of New York City.

The plan was one of three actions by private, local and state groups last week showing a renewed and widespread interest in the marshes.

The barrier would close the Hackensack River and the levee system would extend 8½ miles upstream along both banks of the river. Fresh water drainage from the meadows would be collected in ponding areas near the levees. Pumping stations would then lift the water over the levee into the river.

There would be no pumps at the dam to control the river level. A sluice in the structure would keep the river at mean sea level and a lock would allow navigation.

The dam and its earthen wings, extending to high ground bordering the marshes, would be 16 ft high to resist a 12-ft tide. The present brackish waters of the tidal stream would be turned into a fresh water lake behind the barrier.

The report was made by the Netherlands Engineering Consultants to the Meadowlands Regional Planning Board. The board is composed of five north Jersey communities and is drawing up its own plans for the reclamation of 7,000 acres of marshland within their jurisdiction.

Action by the board on either its own plans or the Dutch study is now uncertain because of a new interest on the part of the state government in development of the meadows. The state wants to set up a regional agency to direct a concerted attack for reclamation of the whole meadows. Piecemeal efforts have been tried with some success, but an area-wide development of the meadows could be worth billions.

Mon Dieu! A Skyscraper's Going Up on the Left Bank

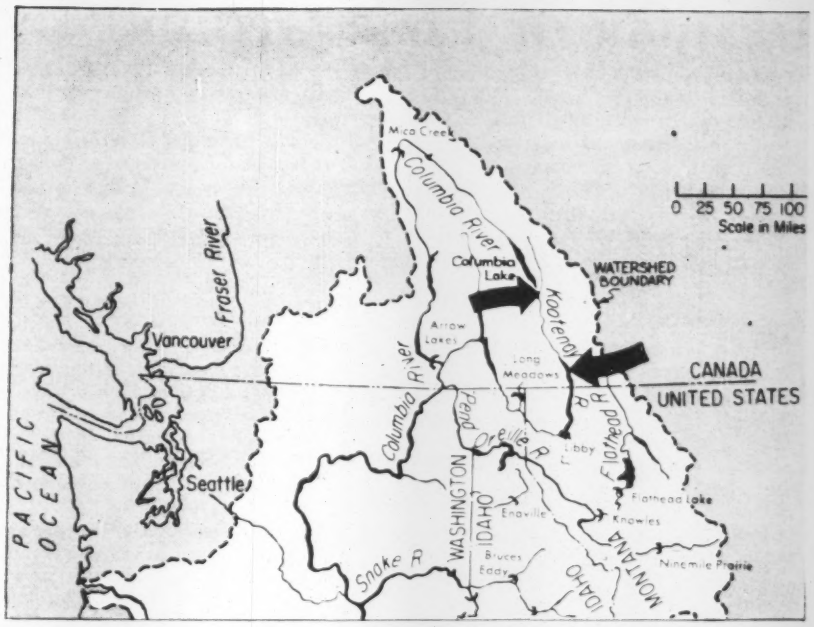
Frenchmen may shudder at the thought, but tourists will enjoy it.

Europe's tallest skyscraper has been proposed for Paris' Montparnasse, the Left Bank district frequented by writers, artists and sculptors.

The 52-story, 600-ft-tall building would house Paris' largest hotel, office space and a roof-top restaurant.

It's part of a major development program in Montparnasse.

Previously, Paris buildings have been limited to about 10 stories on the theory that the skyline is part of the city's atmosphere.



KOOTENAI DAM at either arrow would impound water for diversion into Columbia.

US, Canada Get Columbia Plan

Prospects for international development of the Columbia River system brightened considerably last week. At a special meeting in Chicago, the U.S.-Canadian International Joint Commission heard the highly promising results of an 18-month study by its international Columbia River Engineering Board.

In essence, the engineer findings recommended three feasible plans for over-all development of the river. On a benefits-vs-cost basis, the three schemes are roughly equivalent, with no great difference in eventual economic yield of combined water-resource values—flow regulation, power production, flood control and the like.

Two of the plans call for diverting portions of a Columbia River tributary, the Kootenai River, into the headwaters of the Columbia itself. The third involves no diversion but relies on presently contemplated development of both the Kootenai and the main stem of the Columbia in Canada.

For the Kootenai, these existing proposals include Libby Dam in Montana.

Hydroelectric power is the largest and most valuable benefit to be derived from basin-wide development, the engineering board reported.

Cooperative development and operation of projects would make it physically and economically feasible to produce an average of more than 16 million kilowatts, utilizing some 50 million acre-feet of storage.

The smaller of the two diversion schemes promises the maximum development, the board's power studies show. This scheme calls for a dam at Copper Creek on the Kootenai River, 12 miles south of Columbia Lake—the source of the Columbia River. Copper Creek Dam would back water up the Kootenai at sufficient elevation to deliver 3,600 cfs (an average of 2.6 million acre-feet a year) into the headwaters lake of the Columbia.

A dam and power installation at the Libby site in Montana would still be feasible even with this volume subtracted from the annual flow of the Kootenai. The benefit-cost ratio for the Libby project would drop from about 1.9 to 1.5, but the development would still have strong justification. This fact is significant because an international agreement would have little chance of Senate approval if the Libby project was sacrificed.

A higher Canadian dam farther downstream on the Kootenai would be required for the second diversion scheme. This dam, at the Dorr site just 10 miles north of the international boundary, would divert 8,000 cfs into Columbia Lake (an annual average of 5.8 million acre-feet), but would rule out Libby completely.

Political and other practical considerations of a non-engineering nature will influence the shape of the agreement now foreshadowed. But the engineering report points out that certain projects common to all three schemes could be recommended by IJC for early development before final decision is made on one selected over-all plan.

More ICBM Bases

Air Force will build two Titan bases, one for Atlas

The Air Force plans to build three additional bases for intercontinental ballistic missiles. These will bring the number of ICBM bases in the U. S. to ten.

Sites of the three proposed bases are Elsworth Air Force Base, Rapid City, S. D.; Mountain Home Air Force Base, Mountain Home, Idaho, and Schilling Air Force Base, Salina, Kan.

These bases are included in the upcoming federal budget. Congress has yet to authorize construction and appropriate funds for them. Therefore calls for construction bids won't be made for at least six months.

Elsworth AFB and Mountain Home AFB will support Titan ICBMs. Facilities for these 110-ton, liquid-fuel missiles will all be underground (ENR Feb. 19, p. 32).

Average costs of the Titan bases will be high—from $80 million to $100 million—because of the subsurface work. These costs cover not only construction, but fixed electronic equipment and elaborate ground handling apparatus.

Schilling AFB will accommodate Atlas ICBMs. These 75-ft-long armed rockets will be served by above-ground launching facilities. The Atlas will be ready for operational use in three or four months. Atlas bases will cost between $30 million and $40 million.

Air Force officials also announced the allocation of $190,000 to build a liquid oxygen plant at Offutt AFB, Omaha, Neb., and $290,000 for construction of a similar plant at Warren AFB, Cheyenne, Wyo.

New Erection Tolerances In Revised AISC Code

The American Institute of Steel Construction has released a revision of its Code of Standard Practice for Buildings and Bridges. The most important change covers tolerances permitted in erection.

The code had required certain columns in multistory buildings to be plumb with an error not exceeding 1 in 1,000. That would have permitted an error of more than 8 in. in designing a column in a 60-story building. The revision limits maximum displacement from any point of a column center line to 1, 2 or 3 in., depending on the type of column and building height.

Other revisions clarify the responsibilities of steel fabricator, erector and owner, with respect to the method of erection, the setting of loose lintels and adequate storage space during erection.

Tallamy: Find Funds or Lose Ground

It will take up to three years to recoup the momentum that would be lost if federal-aid apportionments for the Interstate Highway System were dropped for fiscal 1961.

That's the estimate of Bertram D. Tallamy, Federal Highway Administrator. He delivered his warning at the 35th annual convention of the Association of Highway Officials of the North Atlantic States held in Atlantic City, N. J., last week.

A starved Highway Trust Fund would mean more than just lengthening or cutting down the road program:

- Two-thirds of the nation's state highway departments would have to dismiss some of their engineering help.
- Highway consulting firms in a number of states would suffer heavily from a long slowdown (see p. 22).
- Contractors, now all primed up, would be hit hard.
- And a lot of industrial and commercial construction now waiting for roads to start coming through would be set back.

Those are the indications that A. E. Johnson, executive secretary, American Association of State Highway Officials, culled from a survey of the states.

Everyone is for the highway program, Mr. Tallamy said. Yet a stalemate has developed over money for the trust fund, and too few people are sufficiently concerned.

Combat this apathy, the highway officials were urged. How? Make the facts and problems known to allied groups—but soon. For 1961 funds are due to be apportioned this July 1.

• Short-term answer OK—An interim solution to the financing problem would be practical at this time, Mr. Johnson said. Washington is in no mood, politically, to declare itself on long-range plans.

Also, two highway study reports will be coming out in the future that can supply material for the long-range answer.

One report will be on the increment design study, part of the AASHO test road project. It will reveal how much it costs to build roads to fit various users' needs. This could result in a basis for allocating highway costs.

The other is the new, revised estimates of what it will cost to complete the system.

• Look farther and deeper—The representatives of the North Atlantic states were urged to look beyond their own state lines.

The regional and national aspects of highway problems must be recognized and dealt with, they were told. David H. Stevens, president of AHONAS, suggested more frequent meetings among the policymaking members of the highway agencies.

Nor should the highway agencies ignore the problems of allied transportation fields, the highway men were cautioned. Dwight R. G. Palmer, New Jersey state highway commissioner, guessed that eventually the commuter, or mass transportation, area would be taken in by state highway departments. A start has been made in his state: The New Jersey Railway Agency, recently created to look into the commuter problem, has been put under the state highway department.

• Prequalification of contractors—A panel discussion on prequalification examined the subject from the standpoints of experience, equipment, finances and personnel.

Answers to a nationwide survey were previewed by William F. Hardy, executive secretary, Maryland Contractors Association. Of the contractors who answered, 88% were prequalified in some way or other before bidding, 9% were post-qualified after bidding but before contract award and 3% were both.

A lack of uniformity in prequalification was charged by 76% of the contractors.

But their strongest complaint was that experience is not given enough weight and that it should be evaluated more objectively.

Their feeling is that previous performance is the most important factor since it proves out the other factors.

(Prequalification is necessary in 40 states, and systems vary. Maryland, for one, counts finances 62% and assigns the rest among remaining factors.)

Who should evaluate experience? Contractor consensus is that it should be those in direct contact with them—the field engineers and supervisors.

Some kind of check list of performance was also recommended.

James A. Julian, Delaware contractor, plumped for more emphasis on amount of equipment and its condition.

Personnel and organization should also be increased in weight in the evaluation, said John A. Volpe, national vice president, Associated General Contractors of America.

The contractor believes that experience, equipment or personnel should sit heavier in the scale. But the surety company looks longest and closest at financial responsibility, according to Carroll W. Laird of Indemnity Insurance Company of North America.

Around the World . . .

• Highway robotry—First automatic turnpike entrance gate in the U.S. has been opened at Wellston, Okla. Tickets are issued automatically to motorists at the Wellston entrance.

• Long one coming up—A seven-mile-long pipeline into the Gulf of Mexico is planned by the Freeport Sulphur Co. The line will consist of three pipes, one inside the other: a 14-in.-dia outside casing, a 7⅝-in. hotwater jacket and a 6-in. pipe to carry liquid sulphur. The hot sulphur will come from an offshore mine (ENR Aug. 21, 1958, p. 23).

• Austrian superhighway—The first six-lane highway for Austria is in the planning stage. It will connect Vienna with Wiener Neustadt, 40 miles to the south. Cost is estimated at $30.8 million.

• Buenos Aires hotel—The Argentine government will take bids May 4 on a 600-room luxury hotel.

• Bridge financing—The Buffalo, N. Y., Common Council has authorized a $3.5-million bond issue for replacement of the city's Michigan Ave. lift bridge, which was demolished in a January storm (ENR Jan. 29, p. 24).

• Atomic waste disposal—Under a two-year license proposed by the Atomic Energy Commission, a California firm will pick up low-level radioactive wastes from other AEC licensees and dump the materials at sea. Coastwise Marine Disposal Co., Los Angeles, will package the wastes to insure sinking to a depth of 6,000 ft and drop them in 2,000-fathom water 130 miles southwest of Point Arguella, Calif.

• Solar still—The Interior Department's Office of Saline Water has completed an experimental, deep-basin, glass-covered, solar still for seawater conversion at Port Orange, Fla.

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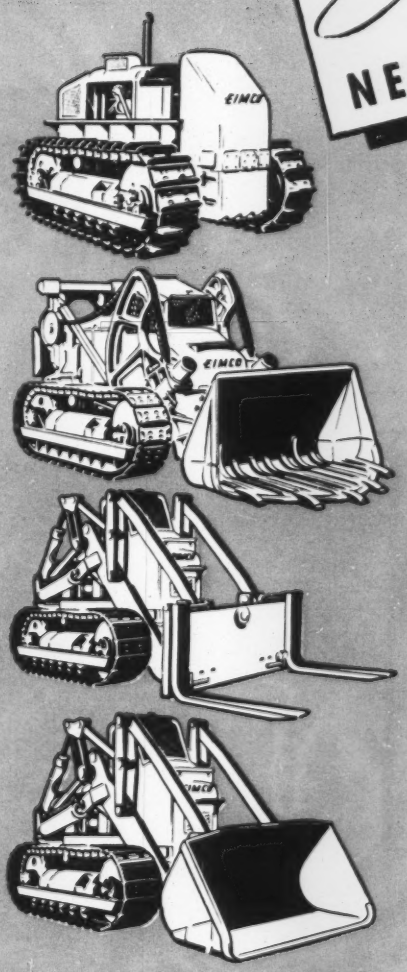

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Mont Blanc Tunnel Will Be the

Tortuous Alpine roads between Italy and Northern Europe can be bypassed by the new tunnel.

World's 'Longest' Shortcut

Motorists traveling between France and Italy will have a much shorter, much easier drive when miners finish carving the world's longest highway tunnel through Europe's highest mountain.

The tunnel will bore 7.5 miles through 15,731-ft-high Mont Blanc on the French-Italian-Swiss border. When completed in 1961, the $30-million tunnel will:

- Eliminate a good day's driving time—five to nine hours—between many Italian cities and France or Switzerland.
- Be the principal road link between France and Italy, Northern Europe and the Mediterranean; and the only all-weather, all-year route through the Western Italian Alps.
- Top by more than three times the world's present highway tunnel record—now held by the 11,421 ft undersea bore across the Strait of Kwannon between the Japanese islands of Honshu and Kyushu (ENR June 26, 1958, p. 45).

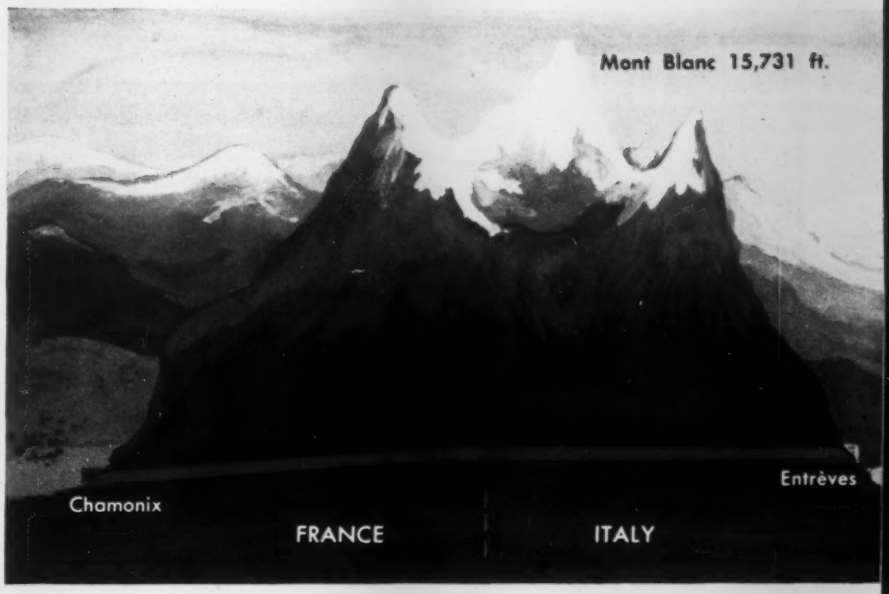
Besides length, the European facility will have a number of other distinctive features:

- About 20% of the fresh air needed for ventilation will come from a natural air flow caused by temperature and barometric variations between the portals.
- There will be emergency parking areas throughout the tunnel.
- Galleries will be cross-cut at 1,000 ft intervals to permit turn-around of vehicles.

The Mont Blanc bore, tentatively called the Alpine Highway Tunnel, has long been a dream of European engineers and highway builders, motorists and truckers. Existing roads across the Western Alps are at elevations in excess of 6,500 ft above sea level. In consequence, they are closed six to eight months of the year. During these months, traffic between Italy and France must make a long detour southward and westward through the Riviera. The new tunnel will change that.

It will also shorten many trips. It will cut the present 97.5 mile minimum run between Chamonix, France and Entreves, Italy, to the near crow-flight distance of about eight miles. It will cut the present 683.5 mile trip between Paris and Turin by 137 miles and it will reduce the 776.7 miles between Paris and Milan by 194 miles.

- **Two headings only**—Mont Blanc is composed almost entirely of hard granite. The tunneling operation is going



A 7.5-mile tunnel being cut through Mont Blanc will . . .

. . . eliminate many road miles between French and Italian cities.

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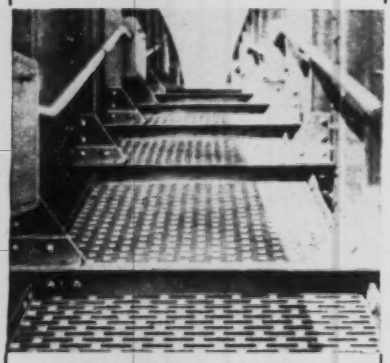

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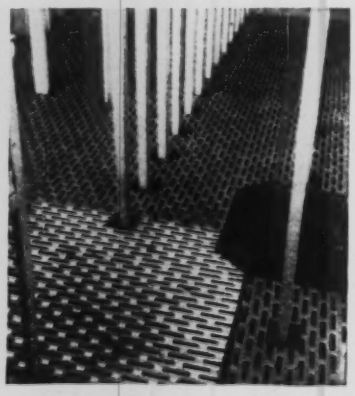

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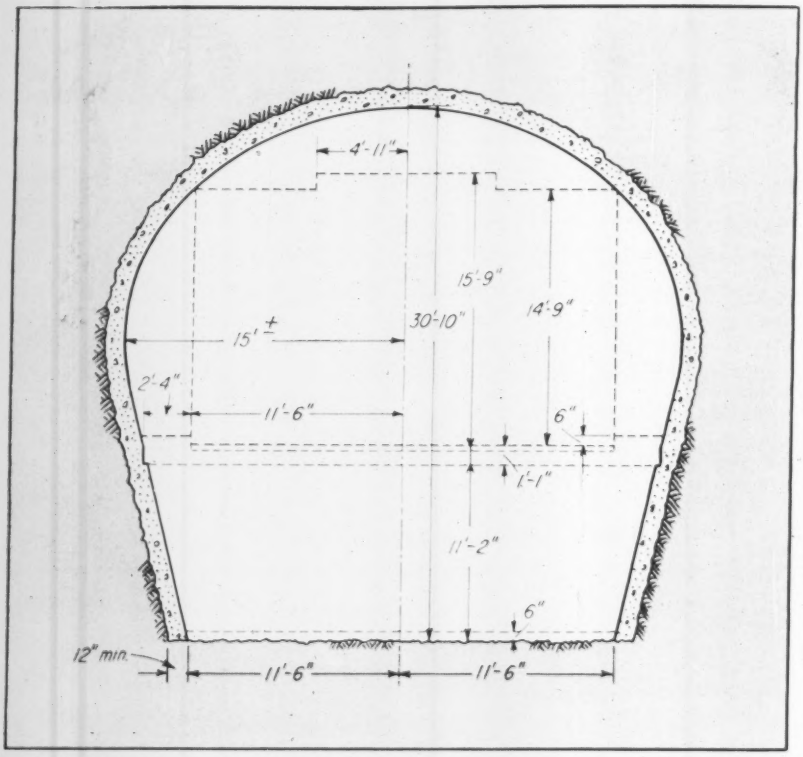


CROSS-SECTION shows the great space left beneath roadway for air ducts and utilities. Structural details of tunnel interior have yet to be worked out.

to be difficult. The massiveness of the mountain makes it possible to work only from the two portals. Shafts or adits are out. This means ventilating systems for construction must be special, and it means muck will have to be hauled out for up to four miles.

In Italy, work has been started near Entreves at an elevation of 4,531 ft above sea level, and the bore is advancing upwards at the slight slope of 0.25%. The French bore will start near Chamonix at an elevation of 4,179 ft and will have initially a 2.4% upward gradient. When the miners hole through, they will be at an elevation of 4,583 ft, yet they will still have more than 8,200 ft of granite above them.

Geological surveys made at Entreves indicate that the first 3,000 to 5,000 ft of the bore will be through calcareous schist. Tunnel men are testing their drilling patterns in this schist to develop the most efficient patterns possible before reaching the hard granite.

The Italian face is being worked by 15 to 18 semi-automatic "Tiger" drills (Atlas Copco) set on pneumatic pusher-legs. These are mounted on a three-story jumbo. Four stationary compressors with a total capacity of 3,530 cfm have been set up at a central supply station near the Entreves portal to provide air for the drills.

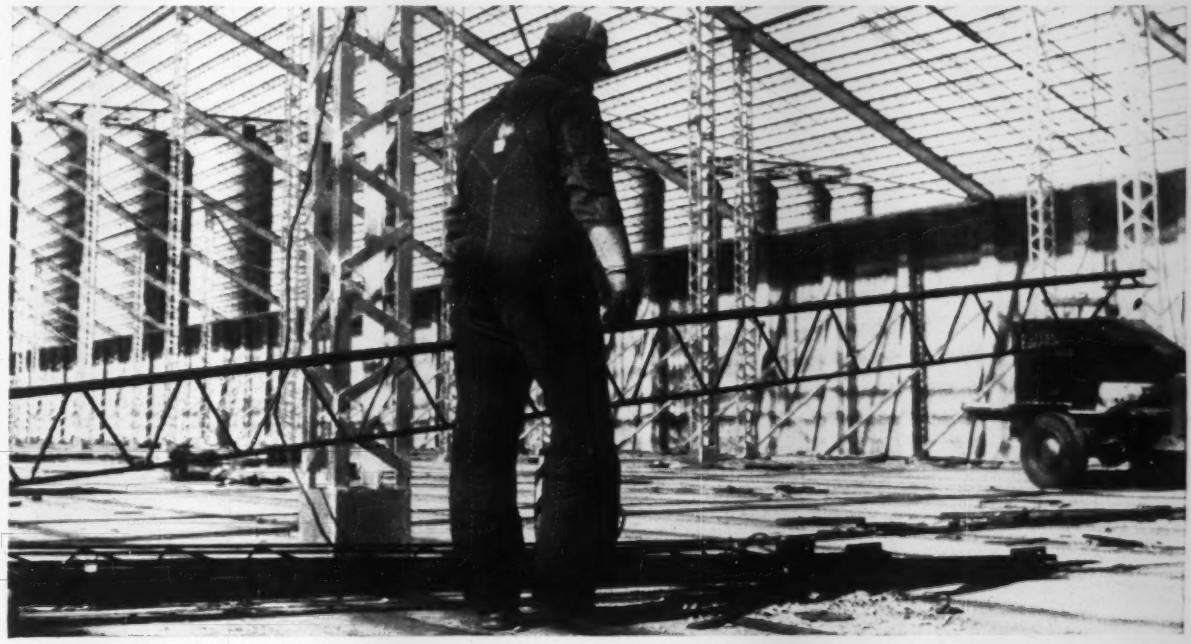
Air for the workmen will be supplied by a 500 hp ventilator and will be sent into the tube through a 6-ft 7-in.-dia plastic pipe that will be extended as the heading moves forward.

• **Cross-section's design** – Final design details are not yet complete. However, the inside of the finished tube will be a horseshoe, 30 ft 10 in. high, 30 ft across at the widest point and 23 ft wide at the base.

The 23-ft roadway will be of reinforced concrete. It will be supported about 10 ft above the tunnel's bottom by the sides of the tube and by an undetermined number of vertical partitions between air and utility ducts. It will be 13 in. thick and flanked on each side by a 27-in.-wide walkway.

Niches for emergency parking will be cut in the walls, about 300 ft apart, for the entire length of the tunnel, and at 1,000-ft intervals on alternate sides of the tube there will be larger parking areas some 65 ft long and about 10 ft wide. Opposite these will be transverse cuts, 16 ft, 3 in. wide and 25 ft, 3 in. deep, to permit vehicle turnaround when necessary. All emergency parking areas will be connected by telephone to the tunnel entrances.

• **Two-way ventilation**—When the tunnel is in operation the carbon monoxide content of its air will be kept below the



This is one of nine government grain bins erected near Wichita, Kansas, in 1958. Pitched roof is supported by Sheffield Steel Joists. Walls and slab are precast concrete. Bin capacity averages about 2¼ million bushels. Width is 140′, lengths varying from 540′ to 720′. Note ease with which one man handles the lightweight Sheffield joist.

Big grain storage units go up faster at less cost with Sheffield Joists

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Here's another example of time and money saved with Sheffield Open Web Steel Joists. The rectangular, pitched-roof structure shown above—framed with Sheffield joists used as purlins—makes an ideal temporary grain storage facility.

Grain bins are just one of the latest applications of Sheffield joists. They've been the choice of leading contractors and architects for years, for all types of commercial and industrial structures (light to medium occupancy) and many residences.

Sheffield joists are the modern structural for supporting floors, ceilings and roofs. They combine strength with light weight, reducing required size of supporting beams, columns and footings. They're installed quickly without shoring or falsework—nothing to take down. And the open webs allow fast easy installation of pipes, conduits and ducts.

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standard 2.5 parts per 10,000 by a combination of natural and mechanical forces. The 352 ft difference in elevation between the French and Italian portals will give the tube a chimney-like draft as barometric variations seek to correct themselves. Prof. Vittorio Zignoli of the Polytechnic of Turin, designer of the tunnel, figures this natural ventilation will provide fresh air at the rate of 161,041 cfm.

The major ventilation will result from electric-powered blowers using a total of 1,580 kw. They will move air through the tunnel at the rate of 636,000 cfm. The fresh air will be brought into the tunnel through 82 sq ft of ducts running beneath the roadway. Stale air and exhaust fumes will be sucked out by ducts running above the ceiling.

Fresh air control will be automatic—on a sectionalized basis. If a vehicle tie-up at any given point in the tube results in excess monoxide content in the air, that section of the tube will automatically receive extra fresh air until the condition is corrected.

The total fresh air requirements for the Alpine Highway Tunnel—just under 800,000 cfm—are based on an anticipated 2,750 vehicles per day, with a peak load of 300 vehicles per hour.

The entire length of the tunnel will be illuminated—with the lights dimming progressively from both portals toward the center. Parking lights will be needed, but not headlights.

The lighting system, automatically controlled by photo-electric cells, will maintain an illumination consistent with the outside light for a distance of 1,640 ft from each portal.

Ducts beneath the roadway will carry new telephone and telegraph facilities between Italy and France, and provisions will be made for handling electric and pipeline installations should the need arise.

• **Border beneath the mountain** – The subterranean international boundary will be at the center of the tunnel's length, with customs offices at either end. The boundary will not correspond with the International frontier.

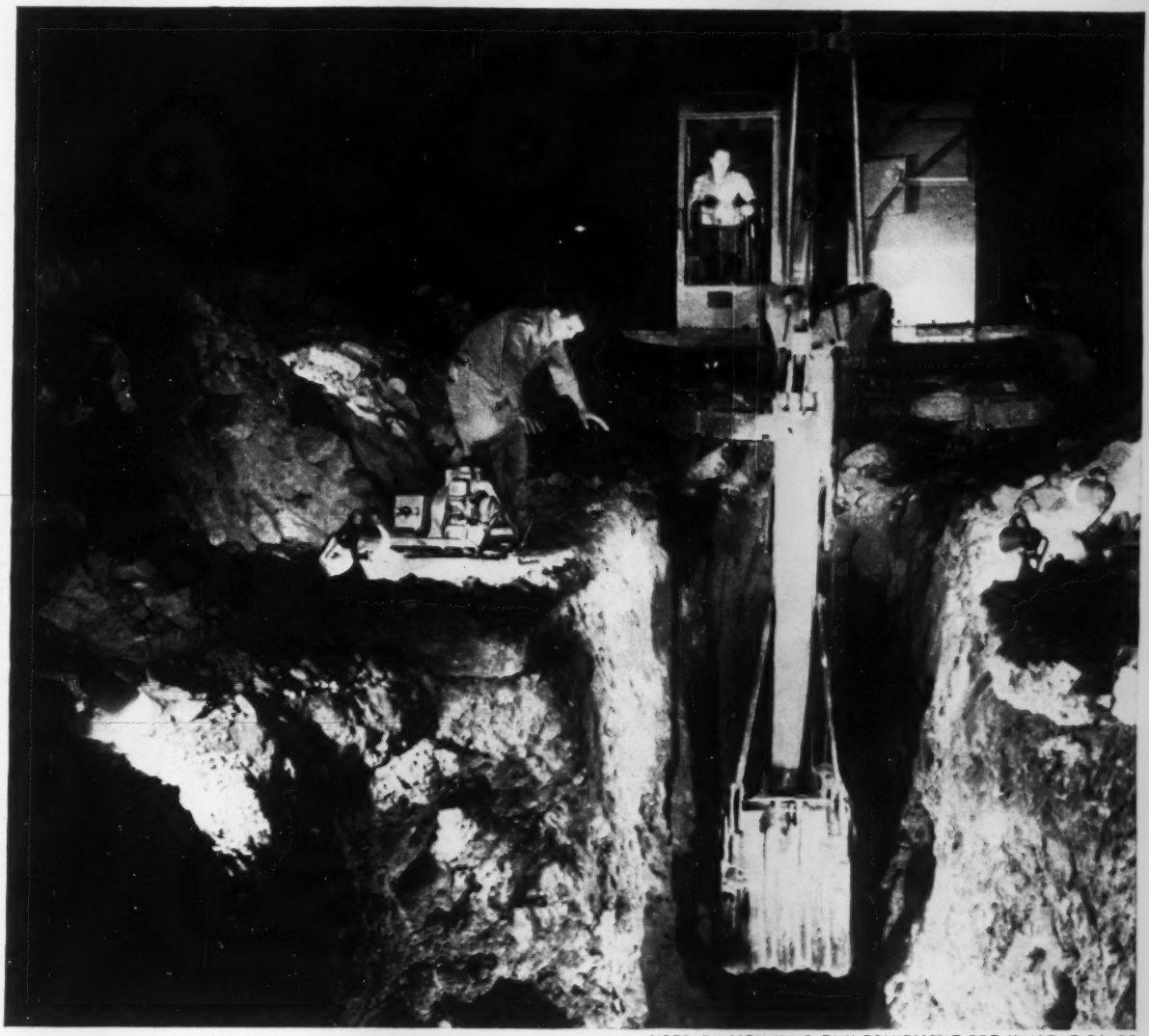
The $30-million Alpine Highway Tunnel is being financed principally by Italy and France, although Switzerland is also contributing. The French and Italian companies constructing the tunnel will jointly administer the facility for 70 years after its completion. Then the tunnel will be taken over by the French and Italian governments.

Work on the Italian bore is being done by the Societa Italiana per Condotti d'Acqua of Rome under the supervision of the Societa per il Traforo Monte Bianco of Rome. Contracts for the French section will be let soon.

Six Other Alpine Tunnels Coming

The Mont Blanc Tunnel is one of seven Alpine tunnels under construction, approved for construction or planned for future construction. The others are:

1. **Col LaCroix**—a two-mile bore on the Turin-Marseille route. It's expected to cost about $4.5 million, but construction is still in the talking stage.
2. **Mount Blanc**—see accompanying article.
3. **Grand St. Bernard**—a 3.6-mile bore between Italy and Switzerland now under construction and scheduled for 1961 completion. It is being financed jointly by the Italian government and the Swiss Canton (state) of Vallais.
4. **San Bernardino**—a four-mile, $9-million tunnel linking Italy and Switzerland. It has been approved for construction by the Italian and Swiss governments and is scheduled for late 1963 completion. The Swiss section is to be handled as part of a two-stage federal highway program involving the expenditure of $684.6 million (of 2.98 billion) between 1960 and 1969.
5. **Splugen**—a 5.7-mile-long tunnel now under consideration. Its cost is estimated at $18 million. It will link Milan with Basel and Zurich.
6. **Stelvio**—Still in the talking stage, it will link Italy with Switzerland, Austria, Central and Eastern Europe.
7. **Brenner**—14.3 miles and $67.5 million worth of tunnel to replace the Brenner pass. It would be in two bores: one of 10 miles running from Steinach to Colle Isarco; the other, 4.3 miles between Colle Isarco and Vipitano.



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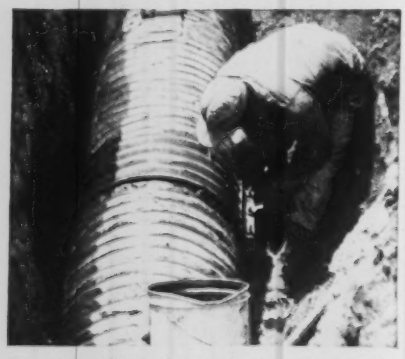
Connecting half-bands are imbedded in asphalt.



Connecting half-bands are bolted, for a tight, leak-proof joint that won't pull apart.

Republic *FREE FLOW* Sewer Pipe speeds up sewer construction

Thousands of new sewers are needed throughout the country as the result of the building boom. In fact, some communities have ruled that sewers must be installed before any more building permits will be issued. The pictures on this page illustrate how Republic FREE FLOW Sewer Pipe can speed up sewer construction.

They show the 1410-ft. installation of 24″-diameter Republic FREE FLOW Pipe on Puritas Road, Cleveland, Ohio. This job was completed in *days* instead of months, because FREE FLOW is:

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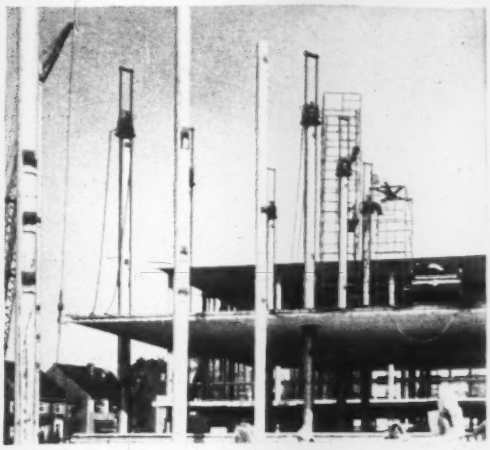
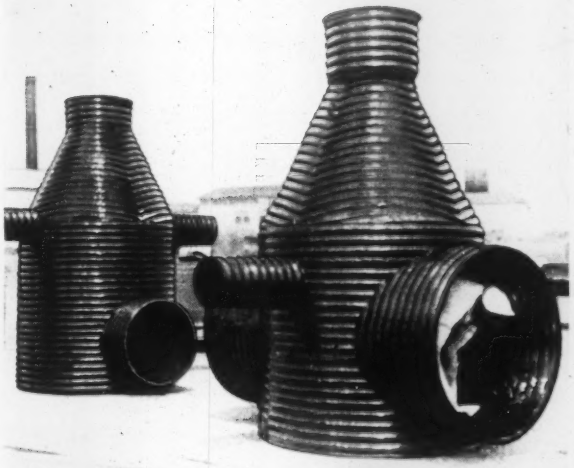
Get a combination of all these superior features in Republic FREE FLOW, the corrugated, riveted, galvanized, coated metal pipe with the smooth, asphalt-lined interior surface. Mail the coupon for your copy of Republic FREE FLOW Sewer Pipe, ADV. 793.



TIME AND MONEY WERE SAVED when Republic Steel Pipe was used in erecing the Tremco Building, Cleveland, Ohio. Slabs were poured on ground, then gradually hoisted up 12-inch diameter pipe, by means of hydraulic screw jacks. Scaffolding, elevators, etc., were eliminated. Slabs were raised at a rate of 3′ per hour.

FOR FAST, DEPENDABLE, FASTENING in highway and building construction, specify Republic Hook-Anchor-Foundation Bolts. Various types and sizes are available to meet specific job requirements, with dimensions ranging from ½″ by 6″ (over-all length) to ½″ by 20″ (over-all length). They can be supplied with regular square nut and flat washer, not assembled — or can be furnished fully assembled, if you prefer.

THE EASE AND SPEED with which Republic Drainage Products can be installed can cut costs of drainage jobs. The complete manhole units shown were installed by the city of Ormond Beach, Florida, in less than a day. The result was a substantial saving over masonry construction. This quick assembly and installation, combined with extra long service life, make Republic Drainage Products your most economical buy.



QUICK, TROUBLE-FREE PERFORMANCE is yours when you use Republic Flexible Plastic Pipe to bring in construction water . . . or drain flooded excavations. Made of tough polyethylene, it resists abrasion and the effects of acids and alkalies. In addition, it is immune to electrolytic action. Lightweight and easy to cut or join, it can be used on job after job.

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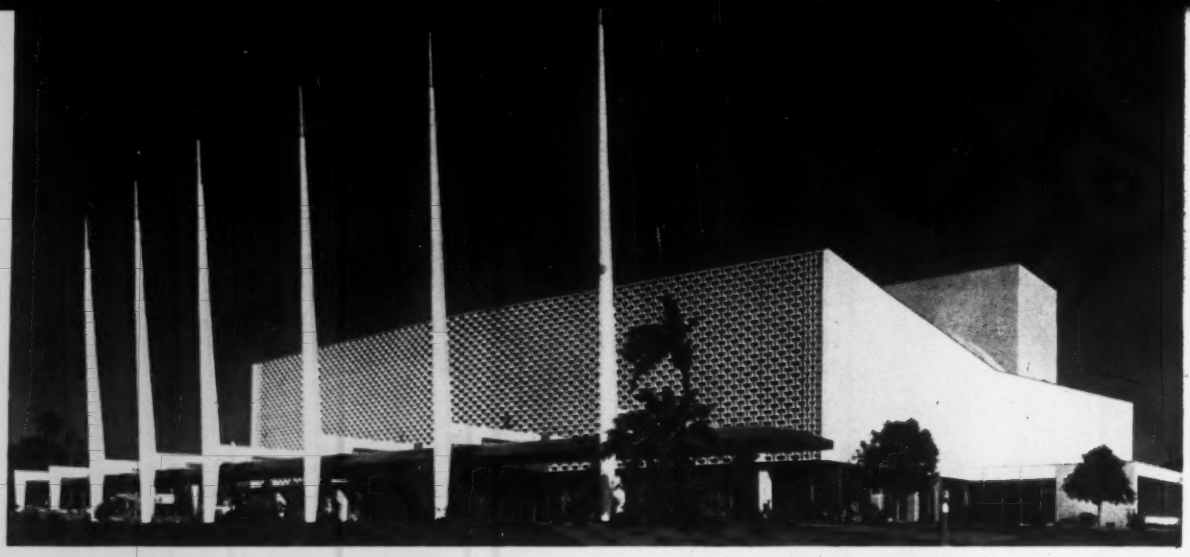


Auditorium Has Two-way Floor . . .

A 12,100-sq-ft tilting floor makes the new Santa Monica, Calif., Civic Auditorium an economical multipurpose hall. It can house large-scale athletic events and still provide music-hall acoustics.

A hydraulic system raises and lowers the slope of the fan-shaped floor. It creates a 5-ft difference in elevation from the rear of the house to the stage.

The structure cost $2.5 million, with $200,000 of that going for the tilting platform.

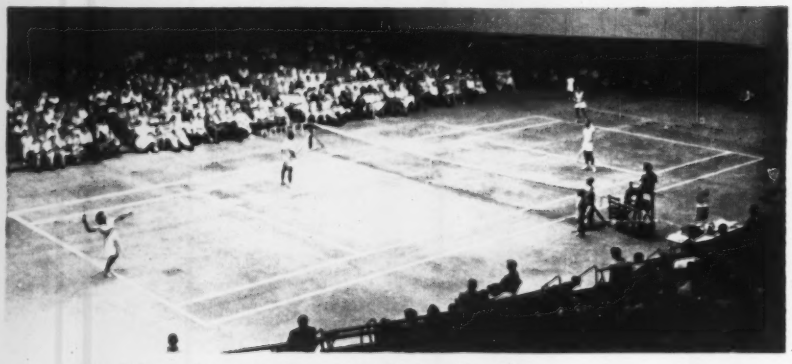
There are two platform positions. With the floor in the tilted position for concerts or other stage presentations, the auditorium seats up to 2,750 persons—950 in permanent galleries in the rear of the hall. Horizontally positioned, the floor platform becomes level with the stage to provide up to 31,000 sq ft of space for sports events or trade shows. With portable bleachers, the auditorium seats 2,750 at a boxing match, 1,900 at a tennis match.

Four 80-k-p hydraulic jacks located at the stage end of the auditorium raise and lower the floor. The jacks are controlled by an elaborate equalizing system, which prevents rolling or torsion when loading inequalities exist. The floor can be moved while fully loaded.

The platform pivots on six cast-steel rocker assemblies. Rockers consist of 5-in. steel pins which rotate in bronze bearings housed in steel castings and weldments. The 3-ft high rocker assemblies are supported on structural steel pedestals. Pivot points are set only 1 ft below the floor to lessen floor arc.

Acoustic requirements for the auditorium complicated the floor's construction. Platform sides were constructed to match the acoustically-contoured walls. This required precise location of curves and determination of platform coordinates.

. . . It tilts for trade shows or concerts . . .



. . . And levels out for tennis or boxing.

Mobile portion of the floor is of conventional construction. The platform is supported by a system of tapered plate girders and wide-flange beams. A lightweight concrete floor covers the metal deck. The entire platform is edged with a specially extruded neoprene gasket that prevents debris from accumulating between wall surfaces and the sides of the platform.

To compensate for the changing elevation of the platform, six adjustable ramps have been installed in the tunnel entrances connecting the foyer and the auditorium. These ramps are automatically positioned by the movement of the floor.

Welton Becket Associates were architects-engineers for the structure, Murray Erick Associates, structural engineers and C. L. Peck, general contractor.

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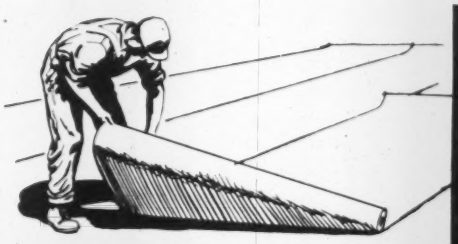

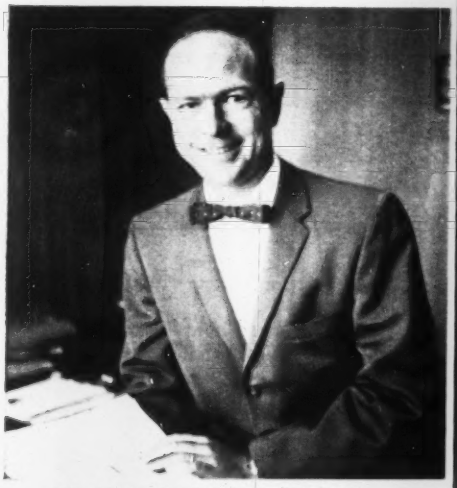

MR. JACK TAYLOR, Haas & Haynie Inc.

Model of
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ARCHITECT: Skidmore, Owings & Merrill and Hertzka & Knowles, AIA San Francisco, Calif.

CONTRACTOR: Haas & Haynie Inc.
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Builders everywhere find that reinforced, scuff-resistant Sisalkraft helps save labor cost because it is so easy to apply. It protects concrete slabs from debris and traffic and helps assure clean, hard, dust-free concrete.

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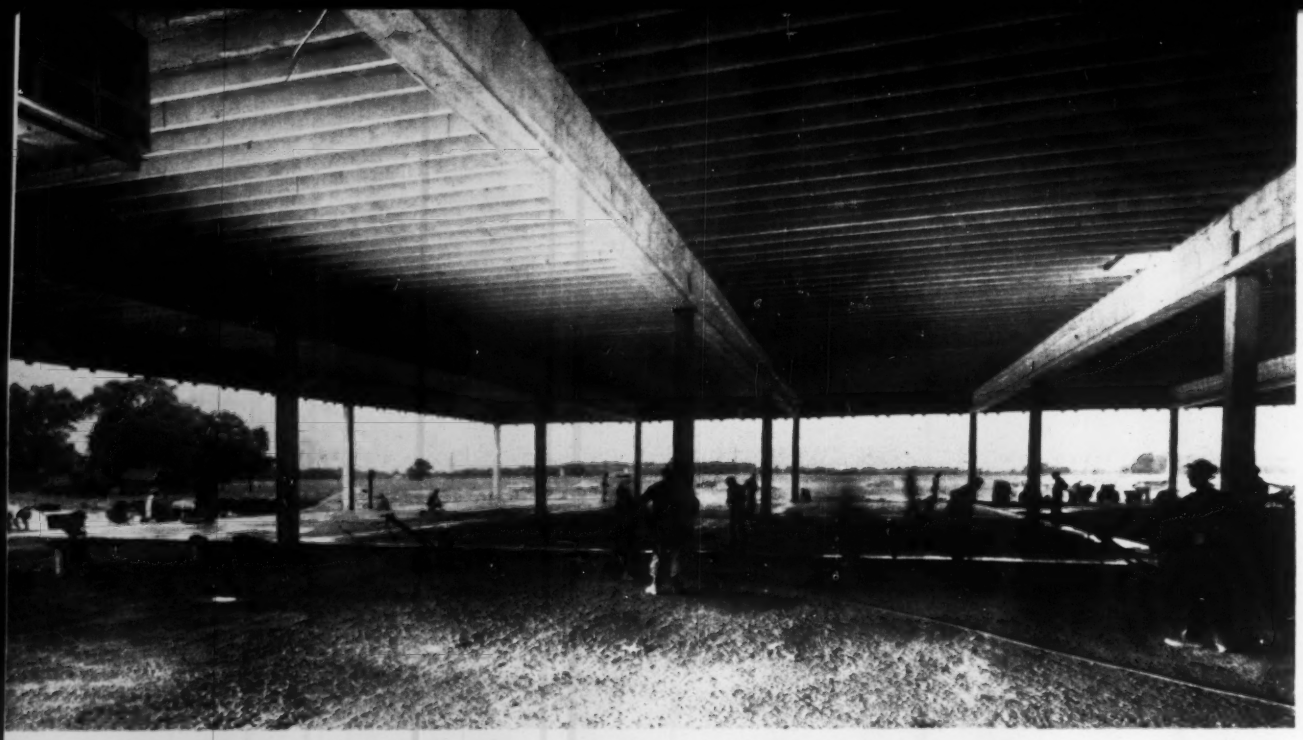


Placing roof panels directly over concrete girders eliminated cross beams.

Simple Concrete Design Produces

The clean-cut concrete design of a recently completed book warehouse won a free trip to Europe for the structural designer.

The New Jersey Prestressed Concrete Association made the award to designer Phillip Gremman, an associate in the office of Alfred Easton Poor of New York City, architect-engineer for the McGraw-Hill Book Co. warehouse in Hightstown, N. J. The building consolidates the company's eastern distribution activities at one location.

The center provides 220,390 sq ft of floor space, including 5,000 sq ft of office space, on a 38 acre site.

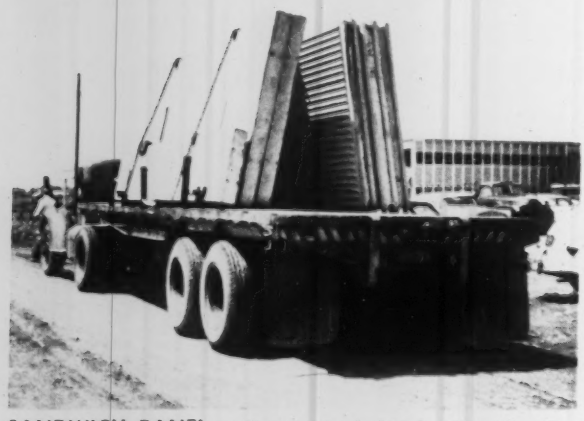
Total job cost is $2.4 million. With all auxiliary services it will come out to about $11.10 per sq ft.

Included in the package are self-leveling truck docks, a highly mechanized stock-handling system, a post office inside the plant, electrical substation, utilities and landscaping.

Requirements the architect-engineers had to meet included speed in design and erection; interior flexibility with a minimum bay size of 25 x 31 ft; future expandability; inclusion of a mechanized handling system to process annual turnover of up to 11 million books, with space for 7 million at one time.

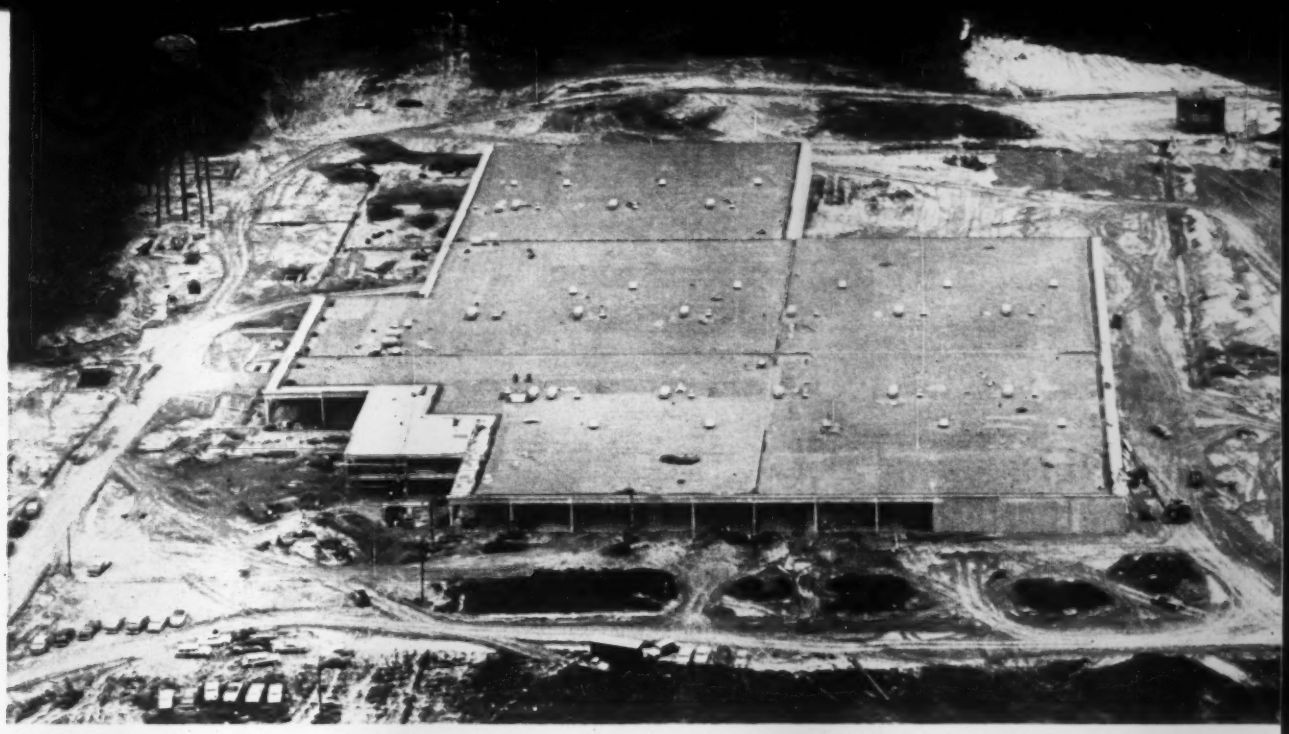
Six different designs in steel and concrete were considered for the job with 15 possible combinations.

The architect-engineer finally recommended prestressed concrete framing and roof deck, 31 x 51-ft bays and concrete sandwich-panel exterior walls.



SANDWICH PANEL sections are trucked in for the walls. Center insulation layer extends clear to panel edges.

SLIM PANELS, used at corners and in office areas, fill out long runs of 6-ft-wide units.



Building covers more than 220,000 sq ft; construction cost was only $11.10 per sq ft.

Economical Book Warehouse

The design has these advantages.

• **Low Maintenance**—Without periodic steel painting the company will save about $6,000 every five years. Painting hazards to stock and operations will also be reduced. There are also some insurance savings for concrete instead of bare steel.

• **Greater Efficiency**—The designers went from the usual 25 x 31-ft bay to 31 x 51 ft for added interior flexibility, easier inventory handling and greater future adaptability. The added cost of concrete over steel (about $40,000) was partly offset by savings made with this larger bay size.

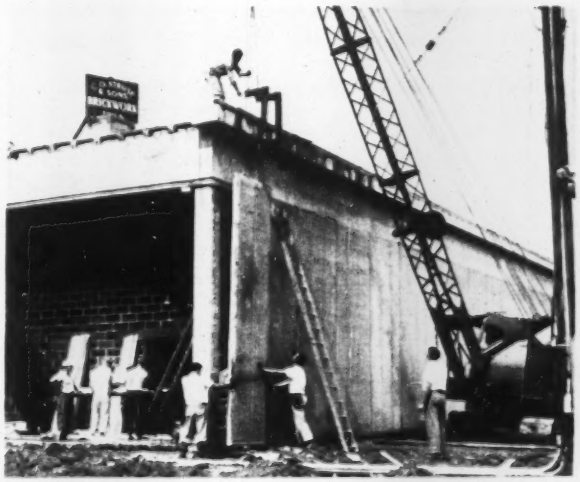
• **Faster construction**—An estimated two-month's saving in construction time resulted from using concrete. The contractor was able to start precasting off the site with only a typical bay designed. Production went ahead at about 4,000 sq ft a day while design details were ironed out.

• **Design simplicity**—The design in concrete required just two depths of precast TT sections—one for the roof deck and one for the second-level office area. Only a dozen or so different framing members were needed for the entire building, including the non-standard two-level office section.

Framing for the single-story building consists of parallel precast concrete girders spanning 51 ft between columns.

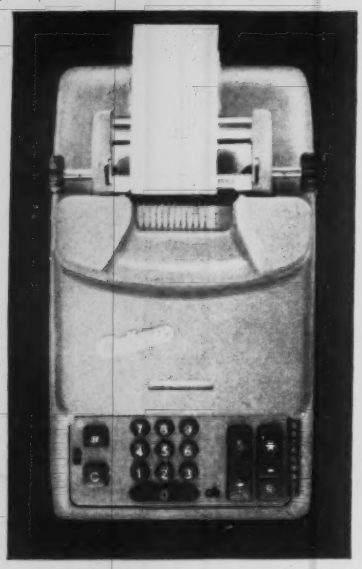
Columns are 14 x 14-in. precast units. They provide 16-ft clearance to the underside of the roof girders.

(*Turn the page*)



RIGGING FRAME that reached under eave overhang helped contractor erect panels in one move.

WORKMAN INSTALLS clip angles, which hold panel tops. Bearing and anchors are on foundation wall top.



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. . . Design key to book warehouse: keep it simple.

The girders over the columns were designed for composite construction with the deck. The top portion of the girders was cast in place after the deck was erected. The cast-in-place concrete was keyed 12 in. c-c near the ends and every 24 in. c-c in the center to the precast girder sections underneath. These keys transmit shear loading from the field-placed concrete top section to the precast, prestressed bottom section.

With this system, the prestressed girder section carries the dead load during construction. The upper field-placed concrete transforms this girder into the final composite section that supports both dead and live loads.

• **Frame connections**—Columns have bearing plates at top and bottom secured with welded dowels. At the bottom of the columns, these plates extend beyond the column edge. Holes drilled through the protruding sections receive anchor bolts embedded in the footing below. Top and bottom leveling and locking nuts secure the columns in place.

Bearing plates anchored to the column tops provide for welded connections with the girders. Matching plates in the girder bottom flange are welded only to the outer edge of the column plate. The designers believe this connection is sufficient since the slight camber of the girder tends to load the center of the column plate more than the edge.

Precast prestressed roof decking has a TT section with top flange 1½ in. thick and webs 12 in. deep. It spans 31 ft between girders. High-early strength concrete for the roof deck was designed for 3500-psi strength at the time prestressing wires were cut.

Plates anchored at the ends of the TT webs were welded to matching plates cast into the girder tops at about 8-ft intervals. This provides strut action between girder lines without the need for additional bracing.

Specifications for the roof deck set camber limits at 1/800 minimum and 1/400 maximum of the span. Insulating concrete placed over the roof deck eliminated any running hump.

A 4-in.-wide burlap strip was taped over each roof deck joint, forming a running breather from below for the insulating concrete. With bonded built-up roofing over the concrete, the breathers are expected to prevent vapor blistering during the summer.

Floor design accounts for hydrostatic pressure from below as well as heavy loading and traffic from above. The water table is only 11 ft below ground level.

The final specifications called for five inches of crushed stone over the compacted subgrade; an inch of sand plus a polyethylene vapor barrier, then a five inch base slab with one inch topping of absorption-process concrete. Two layers of 6 x 6, #6 welded wire mesh are embedded in the base slab.

• **Exterior walls**—Precast sandwich panels enclose the entire plant. The panels are 6 x 17 ft. They consist of three separate 2-in. layers of concrete, foamed polystyrene insulation and concrete. Full-sized panels weigh about three tons each.

The contractor cast wall panels on corrugated steel forms to produce a vertical fluted outside pattern. First, a 2-in. layer of concrete with 6 x 6 No. 6 welded wire fabric was placed on the panel form. Next, the foamed insulation was put down between the shear ties, which extended up from the outside-face reinforcing. Inside-face reinforcing was attached to the ties and inside-face concrete placed over the insulation. A flat screed completed the panel. Side-form tolerance was limited to insure uniform vertical joints in the completed wall.

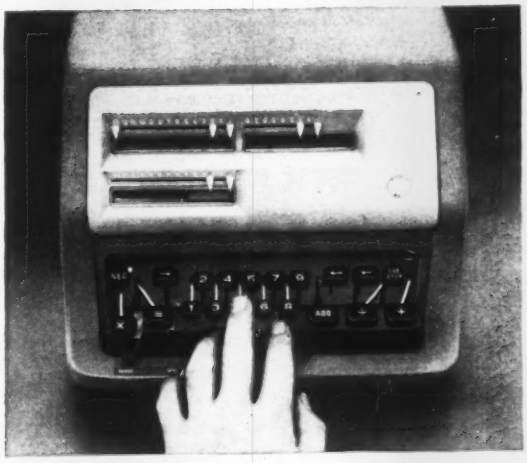
The insulation was carried across the sandwich panel from edge to edge. Joints are groove and spline with a strip of insulation serving as the spline. This provides an uninterrupted insulation blanket from panel to panel. A positive bond between front and rear concrete facings of the panels was made with shear ties through the joints of the insulation.

Cost of the walls in place was $2.70 per sq ft. The calculated heat transmission factor, *U*, of the 6-in.-thick panels is 0.13.

Crews erected the panels with a crawler crane equipped with a hanging frame shaped to extend under and inside the edge of the protruding eave beam. Workers caulked the finished wall with a polysulphide-base compound. In place, the panels were fastened with clip angles to the spandrel girder and held in place at the bottom with an anchor plate cast in the top of the foundation wall.

Sandwich panel walls are ideal for this plant, the designer says, because expansion is a basic part of the company's long range plans. The panels can be removed and reused, stripping a precast eave off the top of the spandrel girder exposes a seat and base plates for additional framing.

John Lowry, Inc., of New York City, was the builder. Atlantic Prestressed Concrete Co. of Trenton, N. J., was the concrete contractor. Kalman Floor Company was the contractor for the heavy-duty floor slab.



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The new bridge is unique in design. It is a double-deck, tied-arch span, 752 feet long. Two 4-lane roadways are supported by 112 prestressed USS Tiger Brand suspender ropes, each 3¼ inches in diameter. A total of 8960 feet of suspender rope was used in the bridge.

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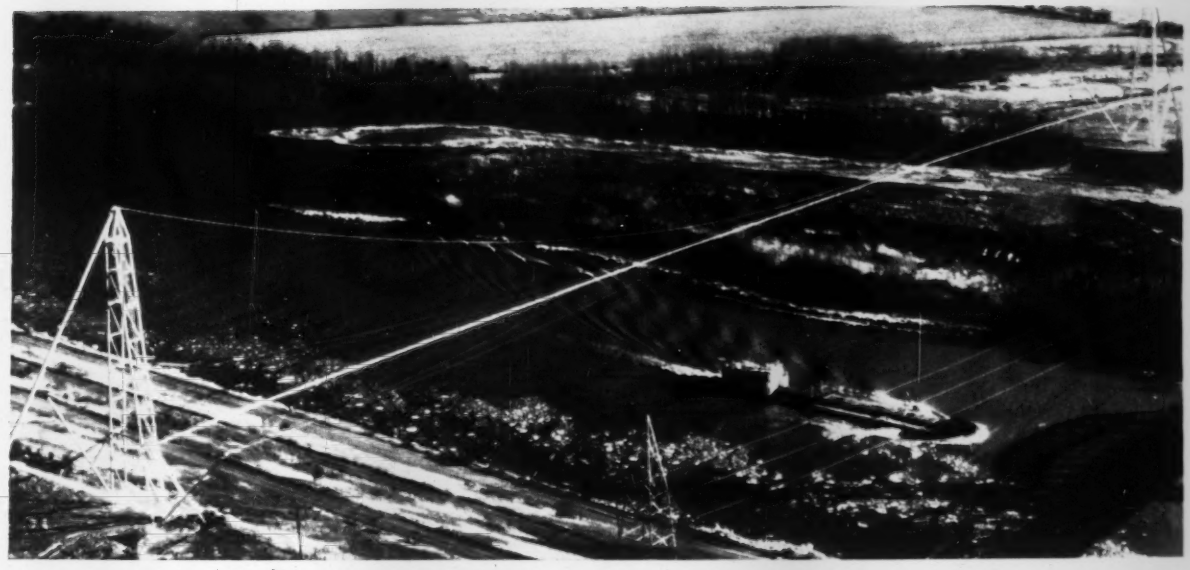

Pipeline Makes Fast Canal Crossing

Slinging a 12-in. pipeline across busy Chesapeake & Delaware Canal held up water traffic for only 24 hours. Preassembly and extensive use of wire rope did the job.

First a three-legged tower was assembled on each bank of the canal. One tower was 147 ft high, the other 181 ft. They lay on their sides with the tops pointing toward the water. The forward legs were attached to foundations.

Meanwhile, a 1,280-ft-long section of pipe to span the water was prepared on one shore. It was fitted with a 1,304-ft length of bridge strand to serve as the main support for the pipeline. The 2⅛-in. wire rope was prestretched to remove all constructional stretch and insure a uniform high modulus of elasticity.

The main strand was attached to the pipe by 63 suspenders of ½-in. bridge rope, in lengths of from 3 to 113 ft.

A construction "trolley" of 1½-in. wire rope was strung across the canal. It carried the weight as a 1-in. winched cable pulled the pipe and supporting strand assembly across to the opposite bank.

Open sockets attached to the main strand were then pinned to the tops of the towers. Winches pulled the towers upright, and the back legs were welded to foundation plates. Wind cables were attached later.

The pipeline is suspended 141 ft above water. The cable and tower assembly is designed for a permanent deadweight load of 64 tons.

Clear Span Engineering Co., Houston, did the design. Midwestern Contractors, Inc., Wheaton, Ill., was the contractor. Trinity Steel Co., Dallas, fabricated the towers and Bethlehem Steel Co. fabricated the bridge strand and wire rope.

Desert Road Is Builder's Oasis

A new 29.3-mile, four-lane road across the Mojave Desert in eastern California —Victorville to Barstow—was a road-builder's "dream."

Fredericksen & Kasler, Sacramento, general contractors for the project, had bid $5.1 million for this longest freeway segment ever awarded in California under one contract nearly $1 million under any of the 13 contractors who bid the job. California received a badly needed freeway at a net cost of $200,000 per mile.

Besides the four lanes of paved highway, the job involved construction of six bridges and several interchanges. The "dream" road passes through uninhabited and relatively flat desert terrain. There were no private property rights to be respected; no utility lines to hamper progress. It was a "high production" job with nothing in its way.

Field work began July 22, 1957. First problem was to provide an adequate water supply. F&K estimators think one reason their competitors were so much higher in bidding was that they apparently figured on hauling water in trucks from Victorville or Barstow. F&K drilled a 160-ft well near Victorville and pumped water through an 8-in. pipe into 12 earth reservoirs dug along 24 miles of the route.

Another item helped put F&K low: Others estimated that 300,000 to 400,000 cu yd would have to be blasted on the route. F&K estimated a maximum of 100,000 and blasting turned out to be only 70,000 cu yd, with the remainder of the limestone broken by rippers.

Pavement construction involved laying 3 in. of dense-graded plant-mix surfacing on 6 in. of cement treated base. Each of the 24-ft traffic lanes got a 1½ in. top surfacing of open graded plant mix. This gives an improved wearing surface and distinguishes traffic lanes from shoulders.

Of six bridges built, the most interesting is the North Victorville underpass, a grade separation for the Mojave Northern Railroad. This is a 208-ft long welded steel plate girder structure; two spans supported by a reinforced concrete pier and abutments. It was subcontracted to Vinnell Steel Co., Baldwin Park, Calif.

A motorist traveling the old Stoddard Wells Road between Victorville and Barstow previously had to cover 34 miles instead of the freeway's 29.3 miles.

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Alcoa's new aluminum beam guard rail for highways combines maximum safety with modern appearance and minimum upkeep. Fabrication from high-strength aluminum alloys assures increased energy absorptive capacity.

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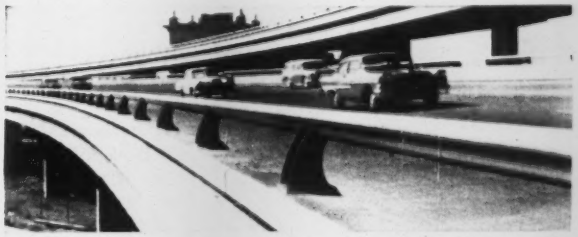
Now is the time to get the full story on Alcoa Beam Guard Rail, Lighting Standards, Highway Signs, Overhead Structures and Chain Link Fencing. To learn how they help stretch taxpayers' highway dollars, call your nearest Alcoa sales office or write: Aluminum Company of America, 1910-C Alcoa Building, Pittsburgh 19, Pennsylvania.

BRIDGE RAILINGS of Alcoa Aluminum deliver maximum return for tax dollars, because first cost is last cost. Lightweight aluminum is easier to handle and faster to erect. Corrosion-resistant Alcoa alloys never need maintenance; they end painting costs that commonly run to a dollar per lineal foot per year.



OVERHEAD SIGN STRUCTURES eliminate periodic maintenance and the accompanying traffic tie-ups when they're built of Alcoa Aluminum. Tubular truss designs and single-chord spans meet any requirement and their lightness permits faster erection with minimum man power and equipment.

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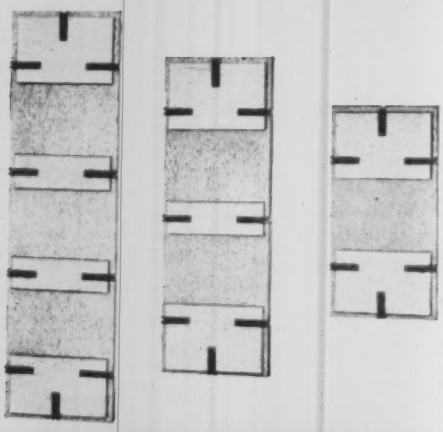

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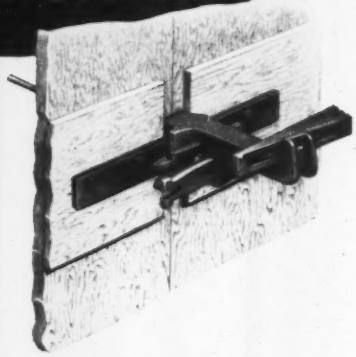

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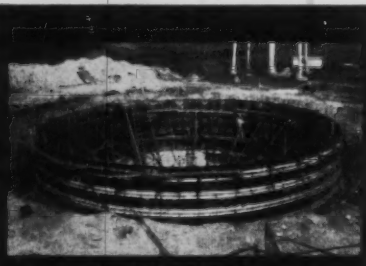
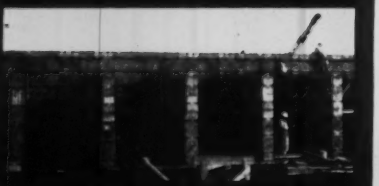


CIRCULAR forming job with All-Ply Panel Forms

BATTERED WALLS demonstrate All-Ply versatility



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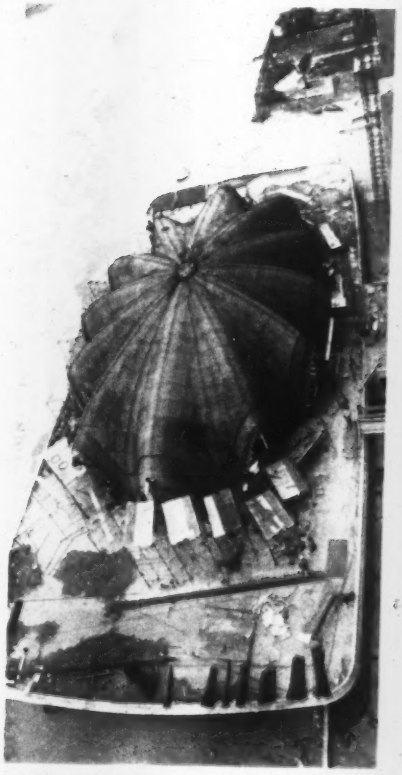
Building a Seashell for a Beach Hotel



WIRE FABRIC reinforces shell-like roof of supper club before concreting.

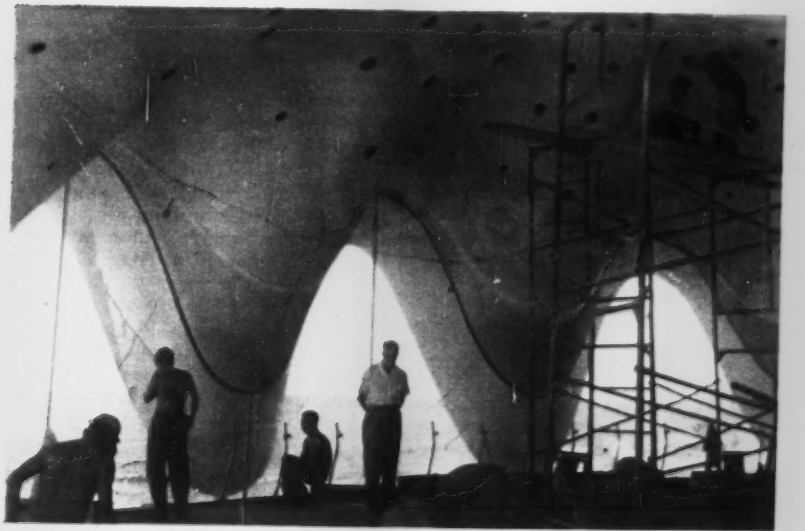
The seashell-shaped night club at the new La Concha Hotel, San Juan, Puerto Rico, does what its supposed to do—attracts and entertains tourists. But for the builders, the design was no treat at all.

No costs have been revealed, but engineers admit expenses have far exceeded original estimates.

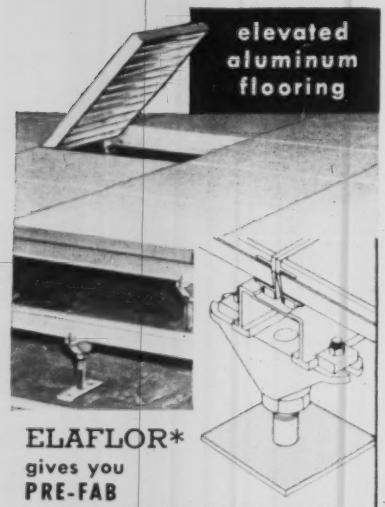
The major difficulty posed during construction of La Concha (Spanish for seashell) was how to place concrete over sloping forms at varying thicknesses using mechanical methods. Other difficulties: keeping the shell's curvilinear design from re-echoing sounds; installing air conditioning; cutting glass to the shape of the shell.

Here's how the job was done:

(*Turn the page*)



SWOOPING WINDOWS—designed to give La Concha guests a dramatic ocean view—meant painstaking and expensive work for glaziers.



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• **Concrete sprayed**—Relatively high labor rates ruled out the "hand-patting" technique for applying the concrete to La Concha. So the contractor decided to use a pneumatic-spray system.

First he built a wood form for the shell—a seven-week task. Ordinary construction lumber was used, but labor costs alone in making the intricate falsework came to about $4,500.

Next, ½-in.-thick pressed wood, prewetted for 30 minutes, was laid over the falsework and molded into shape by pressing. Forming for the shell with these panels and shaping the edges took five days. Another week was spent in reinforcing with wire fabric, placing supports and ridges and adding steel reinforcing bars.

After nine weeks of form preparation, a four-man spraying team went into action. They applied a 1:3 mix: one part cement to three parts of coarse river sand screened over a ¼-in. mesh.

Spraying the shell was complicated by the need to vary concrete thickness in proportion to roof stresses. At the crown of the shell, where stress is minimum, the concrete was made only 3 in. thick, increased to 6 in. at the glass line and to a maximum of 8 in. at the foundation supports. Average daily application was 500 sq ft.

Maximum height of the shell at the crown is 22 ft. The shell measures 98 ft on the major axis, 48 ft on the minor axis and is designed to withstand a maximum 2-in. expansion from temperature changes.

The shell is divided into 12 arched segments or bays. The larger segments required about 10 hours to spray; the smaller ones, 8½ hours.

After the concrete was placed, it was plastered and spray painted. The plastering and the steep slopes of the shell made additional waterproofing unnecessary.

• **Other problems**—The curvilinear design of La Concha tends to re-echo sound. To solve this problem, a hung ceiling of wire fabric and channels was covered by sound-absorbing asbestos material, sprayed on. Numerous electrical connections for stage lighting were installed between the shell and the insulated ceiling. This acoustical ceiling itself is speckled with multi-sized recessed lens slides and pinpoints.

Window installation was tedious and expensive. A crew of glaziers, brought over from Miami, took eight days to cut and rig the windows. Each panel had to be cut painstakingly to match the shell's arched edges.

Placing air-conditioning ducts posed another problem. All these had to be located in the floor. The air, therefore, will flow up the side of the shell towards the crown.

HEXAGONAL CONCRETE BLOCKS draw attention to hotel's facade.

The floor of the club is an oval disc. It appears to float like a raft inside the stainless steel footings of the roof shell. It rests on a platform 22 ft high and can seat 220 persons.

The hotel next to the supper club also has an eye-catching feature—an expanse of 832 hexagonal concrete plates that soar the height of the main wing, and a horizontal belt of these same plates over the cabanas.

The hotel is 322 ft long and 236 ft wide. It contains an estimated 306,944 sq ft of floor space. The guest wing, the largest element in the E-shaped structure, is 12 stories high. All structural work is reinforced concrete.

There is no heating system. The project is completely air conditioned.

Toro & Ferrer, San Juan, were the architects. Mario Salvadori & Paul Weidlinger, New York City, were the structural engineers. Taylor Metropolitan Construction, Inc., was the general contractor. The hotel was built by the Puerto Rico Industrial Development Co., a public corporation, for Landrum-Mills Corp., Dallas.

Canada Calls for Bids On Champlain Bridge Job

Canada's National Harbours Board has called for bids for the construction of the first section of the Champlain Bridge, which will span the St. Lawrence River from Montreal Island across Nun's Island to the South Shore.

The proposed section will span an 800-ft space between Nun's Island and a northern section of Montreal Island.

(*International continued p. 53*)

Photo by Benrimo Studio

8" Transite Sewer Pipe being installed, Winchester, Mass.

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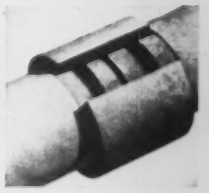

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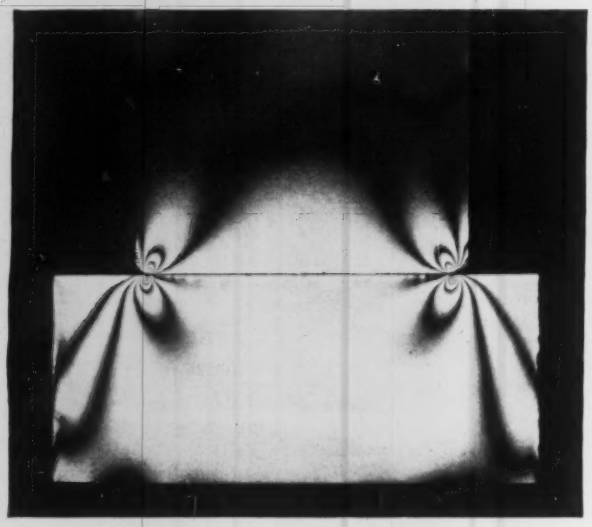
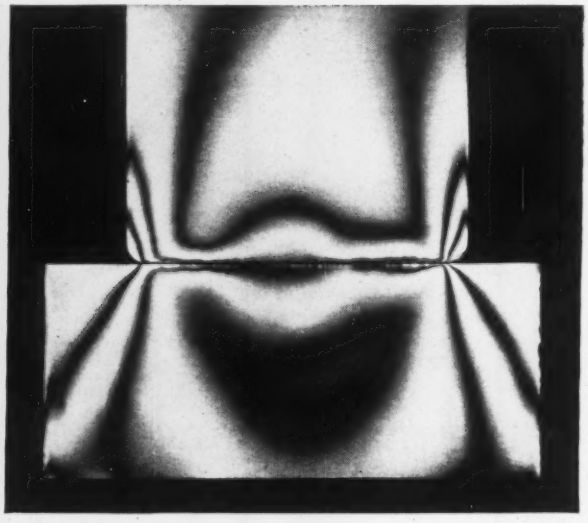
ROLLER BEARING LIFE AND CAPACITY LINKED TO STRESS DISTRIBUTION





These reproductions of photoelastic studies contain important evidence for every engineer and designer concerned with the performance and selection of roller bearings. In these photographs, the alternate dark and light areas, called fringes, indicate not only the magnitude of stress but also the stress distribution. The photographs were taken by Bower Research Engineers during a study of stress distribution in roller bearings.

The subjects represent rollers and raceways of two roller bearings under identical loads. The illustration at the left shows a roller of conventional design. The illustration at the right shows a Bower "Profiled" roller. That is, the roller is precision ground with a large radius generated along the body of the roller—a predetermined and controlled distance from each end.

The conventional roller photo (left) clearly shows how, under load, stress concentration builds up in and near the roller ends. This is called edge-loading. Such areas of concentrated stress are the breeding grounds for metal fatigue and eventual bearing failure.

In the photo of the "Profiled" roller (right) stress lines can be seen uniformly distributed across the whole length of the roller and raceway. There are no points of excessive stress concentration, consequently no starting points for early fatigue. Such a "Profiled" roller exhibits a great advantage in improved load carrying capacity, a most important bearing requirement.

Under actual operating conditions, Bower "Profiled" roller bearings show a considerably longer life at higher speeds and under greater loads than conventional roller bearings.

Because of this, and of other Bower features to be discussed in later technical reports, we suggest that you consider the advantages of Bower bearings in satisfying your future bearing requirements.

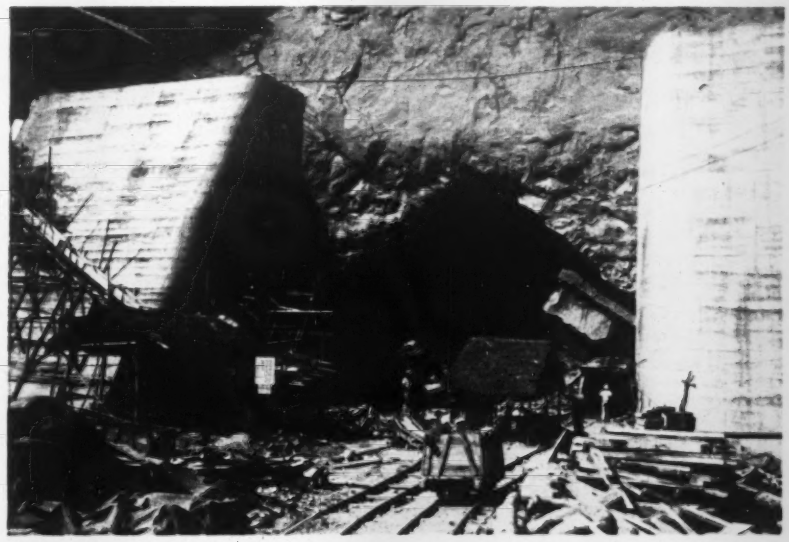
★ ★ ★ ★

Bower engineers are always available, should you desire assistance or advice on bearing problems. Where product design calls for tapered roller bearings or journal roller assemblies, Bower makes these also in a full range of types and sizes.

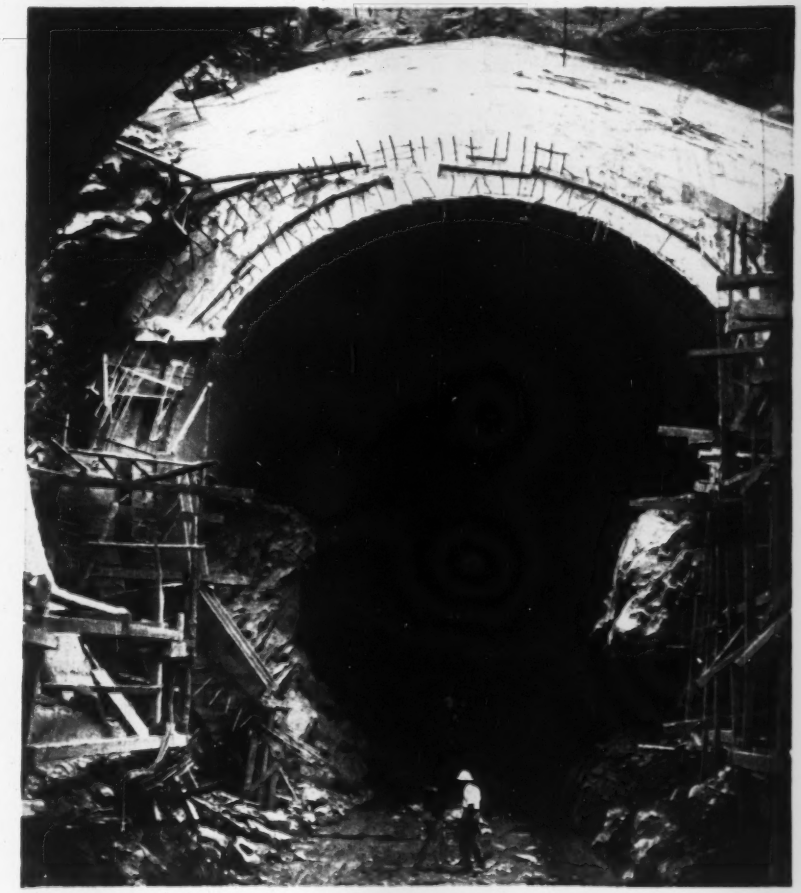
BOWER ROLLER BEARINGS

BOWER ROLLER BEARING DIVISION – FEDERAL-MOGUL-BOWER BEARINGS, INC., DETROIT 14, MICHIGAN

Formosa Starts $800-Million Hydro Job



TUNNEL THROUGH ROCK will divert Takekan Creek water around dam site.



REINFORCED CONCRETE lines the 50-ft-dia, 820-ft-long passage.

The Nationalist Chinese have started a huge multipurpose hydroelectric power project in Formosa. The job began with construction of a 50-ft-dia, 820-ft-long diversion tunnel in rock.

Besides power, the $800 million project will include water supply, flood control and irrigation systems.

The major item is Shihmen Dam, on Takekan Creek. It is slated to be one of the highest dams in the Far East, rising 508 ft above the ground. It will be a 1,500-ft-long arch structure with a 340-ft saddle spillway. More than 1.4 million cu yd of concrete will be needed to complete the job.

The reservoir will cover 3.15 square miles. It will have a usable storage capacity of 204,000 acre-ft.

The intake structure will have two gates about 9¾ x 13 ft each. Sluices will have similar sized gates.

Over 106 miles of irrigation canals will be constructed to carry water to farmlands now lying dormant. Flood danger will be reduced by controlling the level of the downstream Tamsui River, which receives Takekan Creek water. Valuable land along the Tamsui waterway will be made available for industrial and agricultural development.

Three power units of 40,000 kw each—two now, one later—are planned to supply badly needed power for the island fortress' booming industry.

A water treatment plant with an eventual capacity of 335,000 gallons daily is also planned.

Design and construction of the dam is the responsibility of the Shihmen Development Commission, Shihfen, Formosa. Tippetts-Abbett-McCarthy-Stratton, of New York City, is consulting engineer to the commission. Morrison-Knudsen, Boise, Idaho, is the advisory constructor.

Pipeline Runs 226 Miles In Rumania and Hungary

Rumania and Hungary recently completed a 226 mile gas pipeline from Sarmas (Rumania) to Tissapalkonya (Hungary). The job required 16 months for completion.

The pipeline will move 7 billion cu ft of Rumanian methane gas annually to a Hungarian chemical combine. The pipe runs for 77 miles in Hungary and 149 miles in Rumania.

Steel pipe for the Hungarian stretch was delivered by the Russians under a credit agreement.

(Turn the page)

Quaker Thermoid

VERSICON

the all-purpose hose with truck-tire durability

FOR COMPRESSED AIR

It's reinforced with braided *rayon*—the fiber that puts 100,000 rough miles into your truck tires. Thus, with twice the tensile strength of cotton (the yarn usually put in this kind of hose), rayon reinforcement over a specially compounded synthetic tube lets Thermoid VERSICON hose do even more jobs for you.

FOR OIL AND GREASE

VERSICON hose is good for compressed air—especially for use with air-operated drills and pumps—for steam, water, oil, grease, gasoline, welding gases, and many dilute acids. Truly versatile!

FOR WATER AND STEAM

In specified lengths up to 500 feet, sizes $^{3}/_{16}$" to 1"; to 250 feet in sizes $1\frac{1}{4}$" and $1\frac{1}{2}$". Ask the Thermoid industrial distributor about VERSICON hose, or write *Thermoid Division, H. K. Porter Company, Inc., Tacony & Comly Sts., Philadelphia 24, Pa.*

THERMOID PORTER DIVISION

H.K. PORTER COMPANY, INC.

Divisions: Connors Steel, Delta-Star Electric, Disston, Forge and Fittings, Leschen Wire Rope, Mouldings, National Electric, Refractories, Riverside-Alloy Metal, Thermoid, Vulcan-Kidd Steel, H. K. Porter Company (Canada) Ltd.

El Salvador Gets Funds To Complete Coast Route

The World Bank has bolstered El Salvador's highway construction program with a $5-million loan. The money is to be used primarily for the completion of the Pacific Highway.

The Pacific Highway will link the port of La Union, at the southern tip of El Salvador, with Guatemala, to the northwest. The World Bank had earlier loaned $11.1 million to El Salvador for this project.

Guatemala and El Salvador will cooperate in the construction of a bridge over the La Paz river, their common border. This bridge will link the Pacific Highways of the two nations.

El Salvador is negotiating with Honduras for the construction of a highway from the capital city of San Salvador through Honduras to some Carribean port. This would give El Salvador port facilities on both coasts of Central America.

Kaiser in Joint Venture On Aluminum Plant in India

An aluminum plant with 20,000-ton annual capacity will be built at Rihand, in India's north central state of Uttar Pradesh, by a joint venture of G. D. Birla and Kaiser Aluminum & Chemical Corp.

The new plant, which will be India's largest aluminum producer, will be owned and administered by a new company, the Hindustan Aluminum Corp.

Authorized capital will be $24 million. Kaiser will invest 26% of this amount, mostly for plant purchase and equipment. Most of the balance will come from G. D. Birla, with some supplied by the public.

Kaiser will provide technical know-how and supervise plant construction.

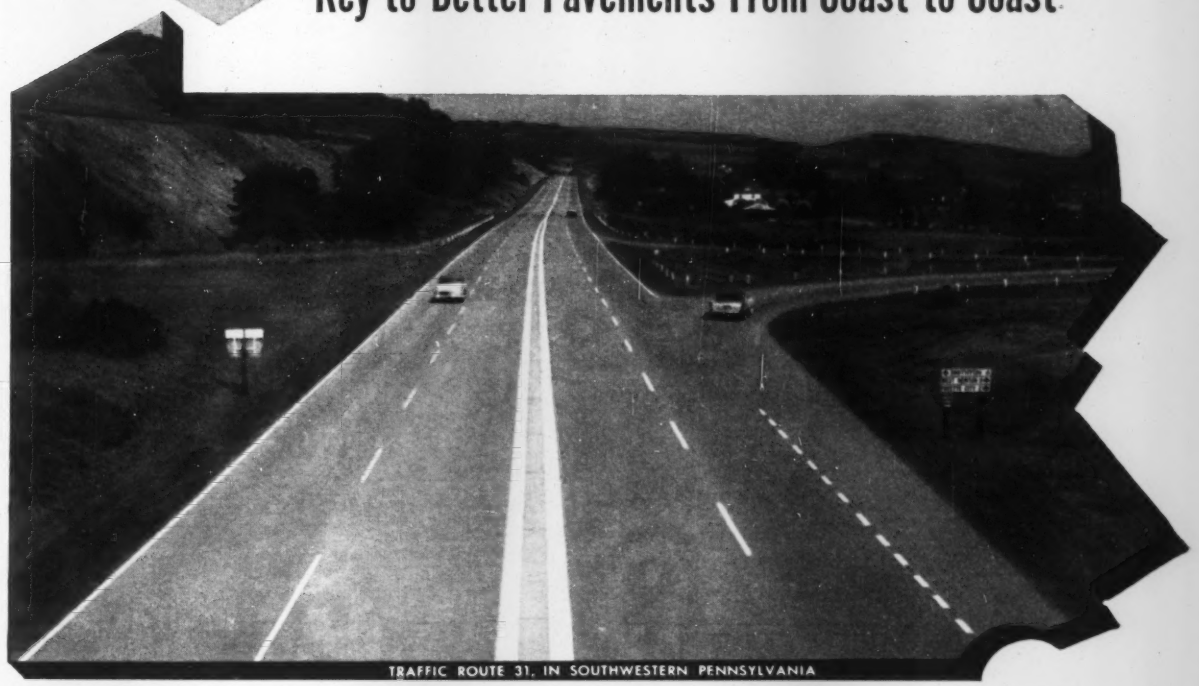
Dutch Again Offer Course in Hydraulic Engineering

The Netherlands is again offering to share its extensive facilities and knowledge in hydraulic engineering through a third, year-long course to be given at the Technological University at Delft. The program is open to anyone with civil or hydraulic engineering degrees and will be taught in English.

Three choices are given in the program: river and navigation works, tidal and coastal engineering, and reclamation. Application should be made to the Netherlands Universities Foundation for International Cooperation, 27 Molenstraat, The Hague, Netherlands, for the course beginning in October, 1959.

CHEVRON ASPHALTS

Key to Better Pavements From Coast to Coast



TRAFFIC ROUTE 31, IN SOUTHWESTERN PENNSYLVANIA

Across the nation, Chevron Asphalts and Bitumuls Emulsified Asphalts are being used extensively by roadbuilders to provide more and better roads for every dollar spent.

KEYSTONE STATE HIGHWAY CONTRACTOR BIDS PROVE ASPHALT DOLLARS GO FARTHER

The Federal Government's 90% payment of Interstate Highway costs has not reduced the need for economy nor the importance of getting more miles of durable pavements for our highway dollars.

Contractor bids and the awarded contractor prices for Interstate Traffic Route 31 of the Pennsylvania State Highway System prove that asphalt paving dollars go farther. TR 31, an important 43.17 mile main Interstate Highway which connects the Pennsylvania Turnpike and Interstate Route 40 was constructed of 21.74 miles of concrete and 21.43 miles of asphalt. Both types of pavement are on the same route and carry the same traffic. They were specifically designed for comparable service.

The total accepted bid price for the 21.43 miles of asphalt: $2,300,450.08. The total accepted bid price for the 21.74 miles of concrete: $3,273,056.51.

Average cost per mile for *concrete* pavement $150,554.57

Average cost per mile for *asphalt* pavement $107,347.18

AVERAGE PER MILE SAVING WITH *ASPHALT PAVEMENT* . . $ 43,207.39

Congress, State Legislatures, and Highway Engineers are now concerned about funds to continue the construction of our important and badly needed Interstate System. The savings resulting from adequately designed, long-life, economical asphalt pavements for the Interstate System will not only allow more rapid completion of the System, but in addition will benefit all of us by providing needed dollars for the constructing, widening, and resurfacing of important- primary, urban, and farm-to-market roads.

Chevron Asphalt and Bitumuls products are available – coast to coast – for use by roadbuilders everywhere. They are backed by service facilities unmatched in the paving industry. A phone call to one of our more than fifty plants, refineries, terminals or offices will bring the information you need on any product or pavement design problem.

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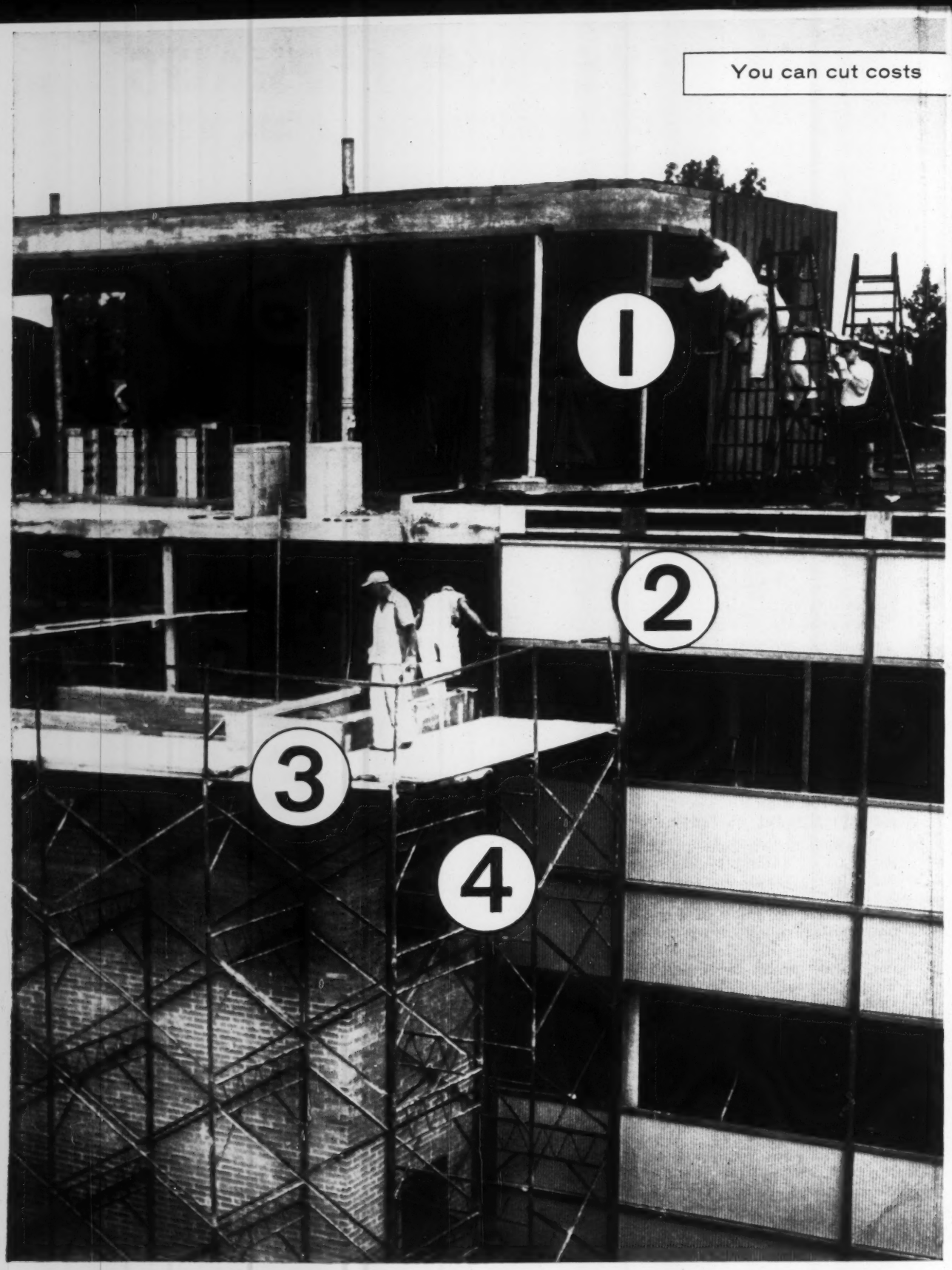
You can cut costs



with expert insurance and safety counsel from **A**merican **M**utual men

Just putting up walls— yet it could cost lives, limbs and profits, if...

1. Man on truss ladder overreaches . . . falls
2. Back rail gives way . . . man falls off scaffold
3. Material is kicked off scaffold . . . hits someone below
4. Scaffold is inadequately secured . . . is pushed over

You don't think of the everyday construction of walls as dangerous work. But like so many other routine operations, it does involve hazards which could easily result in costly accidents.

To help guard against such hazards, cost-conscious contractors call on the accident prevention "know-how" of the AM Safety Engineer. This AM man works together with the contractor and his job superintendent. They carefully survey the project, pinpointing potential danger spots and suggesting methods and safeguards against them. Should an accident occur, AM claim men handle the case quickly and fairly. And American Mutual's modern medical programming gets the injured man back to work as soon as possible.

The net result of this teamwork is fewer accidents and work stoppages . . . faster completion of the job . . . greater profits for contractors through lowered insurance costs plus dividends. All good reasons to call on the long experience of the *friendly* AM *man* before your next bid. Remember, he can advise you on all your casualty insurance needs. American Mutual Liability Insurance Company, Dept. EN-2, Wakefield, Massachusetts.

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American Mutual

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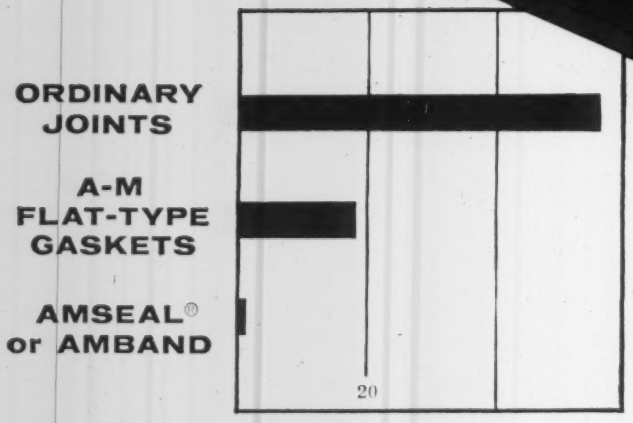
PUT THE SQUEEZE ON INFILTRATION

WITH

AMERICAN-MARIETTA Rubber Gasketed Pipe



American-Marietta flat-type gaskets and longer length pipe reduce leakage and provide savings through faster installation with fewer joints.

For positive control of infiltration specify AMSEAL (Rubber and Steel Joints) or AMBAND (Fiberglass-Resin-Collar Joints).

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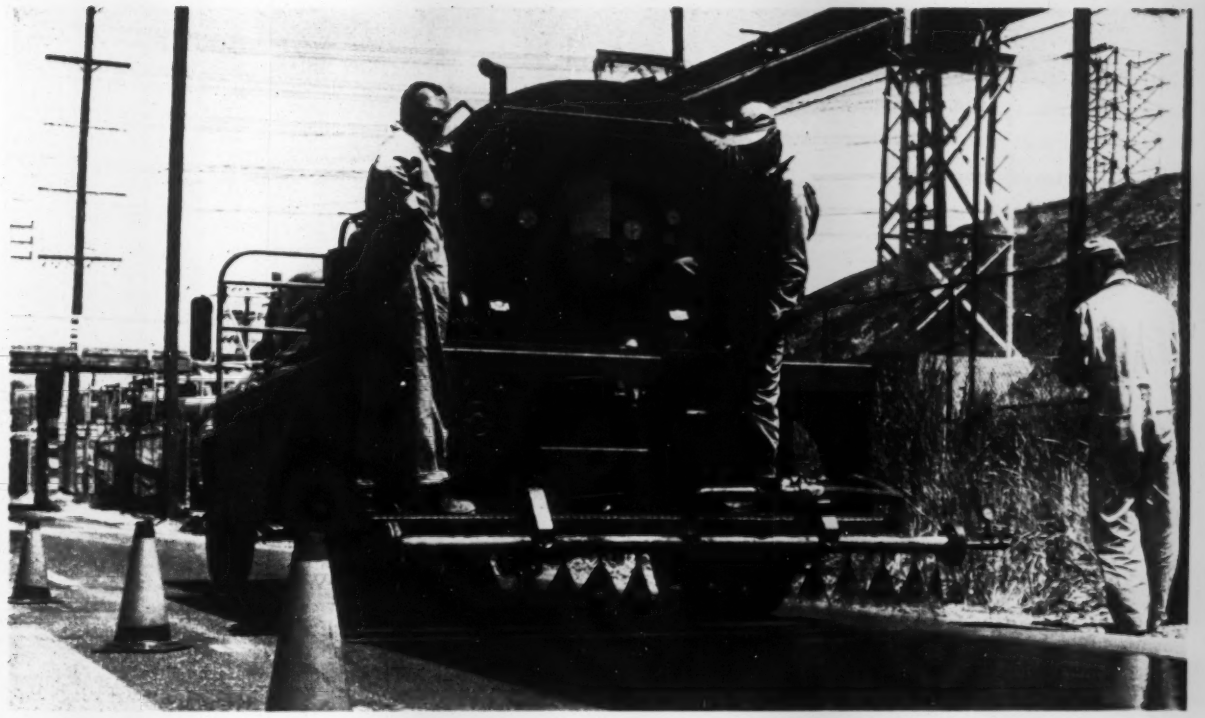
CONCRETE PRODUCTS DIVISION
GENERAL OFFICES:
AMERICAN-MARIETTA BUILDING
101 EAST ONTARIO STREET, CHICAGO 11 ILLINOIS, PHONE: WHITEHALL 4-5600



Coat of epoxy resin is put down by spray truck, then covered with grit. Result . . .

Tough Surface Is Highly Skid-Resistant

Thirty-four test strips—totaling 250,000 sq ft—are proving out a long-life, highly skid-resistant and waterproof wearing surface for highway pavements. The overlay also stands up to road chemicals, including de-icing salts, oil and gasoline drippings.

The tough coating is a thin layer of Shell Chemical's "Epon" (epoxy) resin embedded with grit.

The material—introduced by Shell as Guardkote—is used on both concrete and bituminous pavements at strategic hard-wear points: bridges, overpasses, toll booth plazas.

Epon's development has reached the point where Shell is assembling a nationwide network of firms to compound the surfacing.

The two components of the paving material are delivered to the user as different colored liquids. These are combined in equal amounts just before applying—a foolproof and easy step because of the colors.

The following application procedure produces the best results:

In the case of concrete, the surface is prepared with a weak hydrochloric acid etch, flushed after five minutes and allowed to dry.

Bituminous surfaces usually need no pretreatment. But an especially worn and dirty road should get a scrub with a 2% solution of non-ionic detergent.

The super "glue" is mixed and spread. For large jobs, Shell has developed a two-tank distributor truck that meters and mixes the components before they reach the spray bar. Or they can be mixed in a bucket or concrete mixer and mopped on for small jobs.

The liquid is applied at a minimum rate of 2 lb per sq yd.

Grit is spread over the thin layer of adhesive. This is usually crushed quartz or emery. A conventional machine spreader does the job neatly.

The grit-studded surfacing is allowed to dry. Under the best conditions, a road has been opened to traffic in as little as 45 minutes.

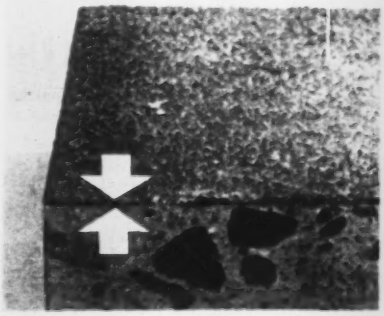
Result is a wearing surface that is lightweight, thin and long-lasting.

When the time comes for resurfacing, a new coat is simply put down over the old one.

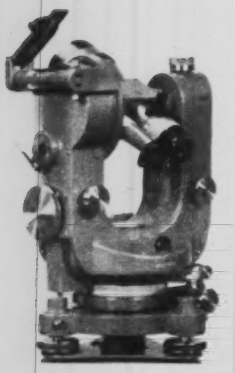
Test applications have gone down in 14 states. These include strips on New York's Bronx-Whitestone Bridge, Lyon's Overpass on Rt 12 in Wisconsin, Oakland Bay Bridge, toll booths in Kansas City and a bus turnaround at 41st St. and 1st Ave. in New York City.

Epon is also recommended by the makers as a waterproof membrane in deck construction for bridges.

(R&D continued p. 60)



THIN OVERLAY provides lasting protection and reduces skidding.



British Theodolite available in America

An Optical Micrometer Theodolite, from Cooke, Troughton & Simms Ltd., Britain's oldest maker of surveying instruments, has been introduced in the United States.

The 9-lb. Model V308 can be read directly to 20 sec. of arc and by estimation to 5 sec. The instrument features brilliance of field of its circle-reading microscope, high magnification of the graduation system and easy reading. The telescope is of the internal-focusing type with a spiral focusing eyepiece.

The V308, complete with spirit levels, optical plummet, centering device and either telescopic or non-telescopic tripod, is packed in a lightweight case.

V308 is a companion to the famed Tavistock Theodolite. Write for information on both.

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OF CANADA: 2052 ST. CATHERINE ST. WEST, MONTREAL

This Is Part of a Wavemaker

Large rubber bags sealed into these weldments will create storm conditions for testing model ships in the Navy's model test basin at Carderock, Md.

The wavemaker works by rapidly inflating and deflating the rubber bags. In addition to creating scaled-down sea storms, the model basin will simulate shore conditions during bad weather.

H. W. Butterworth & Sons, Co., Bethayres, Pa., built the 5-ton weldments for Blount Brothers Construction Co., Montgomery, Ala., the general contractor. Maximum over-all tolerance of 1/16 in. was maintained in the weldments because of precise fixture location. Machining tolerances were held to 0.005 in. on some parts.

CAR BRAKED on untreated strip passes stop point on modified pavement.

"Panic-Stop" Distance Cut

Stops are quicker in locked-wheel skids if neoprene—a synthetic rubber—has been added to asphalt-treated roads.

In "panic stops" at 40 mph a test car averaged 94½ ft of travel with brakes locked before stopping on a conventional asphalt-and-chips treated road.

Where 1½% of neoprene had been added to the asphalt, the dangerous distance dropped to 82¾ ft.

The neoprene keeps a tighter hold on the surface chips of stone. It also allows less oozing up of the asphalt. This results in shorter stopping distances, for when asphalt coats the tops of surface chips, friction and braking efficiency decrease.

The tests showed that the greater the speed, the greater the advantage for neoprene-modified roads. The benefits also were kept on wet pavements.

E. I. du Pont de Nemours & Co. carried out the tests on road laid down by the Delaware Highway Department.

Replaces two crawlers and a compactor with one Michigan... ups output 50%...

Cuts compaction costs $15 per hour

By buying a machine with a "built-in bonus," a midwest roadbuilder is saving at least $15 per operating hour.

Tri-County Trucking Company of Detroit subbed the sand sub-base and all aggregate haul—about 500,000 yards—from Holloway Construction Co, Livonia, Mich, on a 9-mile leg of new Interstate Highway 23 north of Toledo. The sub-contractor knew he'd be pushing a lot of sand fill, so he got to thinking. Sand is hard on crawler tracks—so why not use a heavy rubber-tired dozer?

The unit chosen was a 262 hp, 51,000 lb Michigan Model 280 Dozer. Each 26.5-25 tire was hydroflated with calcium chloride solution—1,750 lbs per tire. Rig was put to work two shifts per day, 6 days per week.

It soon proved fast enough and mobile enough to easily spread the sand delivered by 35 ten to seventeen-yard trucks and semi-trailers. Its output *averaged* 3,000 bank yards (per government cross-section) per 10-hour shift. (In contrast, a 35,000 lb crawler, used elsewhere on the 9 mile job, regularly spread 2,000 yards per shift. Completed lifts in both cases averaged 9 to 12 inches deep.) But there was an unexpected bonus, too . . .

97% Proctor in 2 to 4 passes

The Michigan, working alone, effectively met compaction specs of 95% Proctor. In fact, government tests showed 97% average compaction, after only two to four passes, *including* passes made to spread. No specialized compaction equipment was needed. Thus, says Boyce Grubb, company treasurer, "we eliminated expected use of a tractor-drawn 25 ton roller which, we estimate would have cost us at least $15 per operating hour."

There were other savings too!

1 Michigan's low-pressure tires and rear wheel steer did not tear up fill as other dozers often do!

2 The Michigan alone graded to within a few inches of final specs. According to Supt Tom Quaine, the fill thus required only touchup with a grader.

3 Michigan's 28 mph "go-anywhere" mobility enabled it to move from one end of the grade to another, 9 miles, in 30 minutes or less.

4 Tires, rolling over the sand, instead of grinding in it, saved much of the repair and greasing time needed with each crawler, according to Mr. Quaine.

You can check these savings first hand on *your* job. Just call your Michigan Distributor for a no-obligation demonstration. Four size Michigan Dozers to choose from: 165, 262, 375, or 600 hp.

Michigan is the registered trademark of

CLARK EQUIPMENT COMPANY

Construction Machinery Division

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TYPICAL PRODUCTS . . . fabricated from carbon, stainless and clad steels, and wrought iron.

Large O.D. Pipe
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SAND AND CEMENT "Placed by Air"

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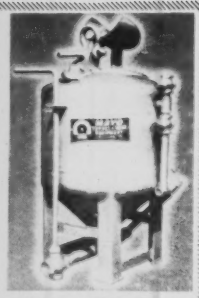
PNEUMATIC GROUTER and "Pea Shooter"

Efficient and easy to operate. Places low pressure grout . . . also injects sodium silicate emulsions to stabilize ground. Readily converts to Pea Shooter. See Catalog No. 13.



MAYO
TUNNEL AND MINE EQUIPMENT
Lancaster, Penna.

New Products

Compact Air Compressor Useful for Curb Work

Curb removal is said to be simplified by a jeep-mounted Worthington Rotary "Power Take-Off" Compressor.

The unit weighs 950 lb, is 38 in. long, 28 in. wide and 39 in. high. All controls are remote and include air pressure, ammeter, engine oil pressure, engine temperature, compressor oil pressure and interstage air pressure gages.

It is driven by a V-belt through the jeep power take-off. Worthington Corp., 426 Worthington Ave., Harrison, N. J.

Expanding Plastic Grows To Conform with Concrete

Plastigrip is a new polyvinyl-chloride waterstop produced in 10 cross sections to meet all design and construction requirements. The wide range of sizes extends from 4½ to 9½ in.

A U-shaped center pleat, the manufacturer says, allows the plastic to expand 50% more than hollow bulb types; its ribbed cross section grips the concrete far better than flat or dumbbell-shaped waterstops.

Plastigrip comes in two grades. Standard is for areas where temperatures will only reach —20F; subzero grade is recommended for lower than —20F.

Plastigrip is heat sealable, requiring neither vulcanizing, solder or mastic. Just heat the ends with a soldering iron and press together. On jobs without electricity, heat a steel plate with a blow torch, apply the ends of the stop to the plate and join in the usual way. Progress Unlimited, Inc., 15 West 44 St., New York 36, N. Y.

Safer Truck Brakes

Modulated brake utilizes air suspension pressures

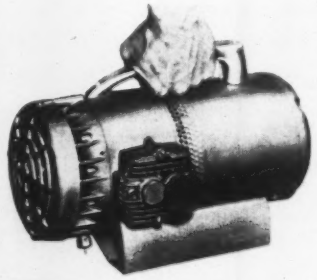
Air suspension on GMC trucks has spawned a truck brake safety development that permits the truck tractor to approach minimum stopping distances under all load conditions, the manufacturer states.

In air suspension, pressure within bellows varies with the load: more load, greater air pressure; less load, less air pressure. This allows the tractor to stay at one height no matter what the load.

The new device, called a modulated brake, makes use of this changing pressure. A brake-regulating valve is added. It automatically adjusts braking effort at the rear wheels in proportion to the load on the wheels.

Up to now no fixed division of braking effort between front and rear wheels provided optimum braking under more than one load condition.

The two new GMC highway tractors, carrying the new brakes are the DLR 8000 and the DFR800, aluminum tilt-cab diesel models. General Motors Corp., 600 S. Boulevard, East, Pontiac 11, Mich.



Portable Vacuum Pumps For Air-pollution Study

Two models of a new piston-type vacuum pump have been introduced for use in radioactive fallout studies and air pollution work. Known as PV-15 and PV-16, they are designed to maintain a continuous vacuum source for air sampling.

Free-air capacity is 2 cfm with the PV-15 and 4 cfm with the PV-16 model. The units are compact and portable. The PV-15 dimensions are 9½ x 9½ x 12½ in. and for the PV-16, 9½ x 10½ x 14 in. A weatherproof enclosure-case is available. Gelman Instrument Co., 233 Jefferson St., Chelsea, Mich.

(New Products continued p. 64)

6 YARDS PER PASS

A seventeen yard tandem-axle truck loaded in 90 seconds!

A twelve-yard semi heaped in 60 seconds!

Over 500 yards loaded EVERY HOUR by just one Tractor Shovel

Someone's dream? Not any more! It's been standard practice on general contractor J. R. Cianchette's jobs near Pittsfield, Maine, for almost a year now. That's when his big 6 *yard* Model 375A Michigan Tractor Shovel went to work.

Cianchette's problem up until then had been a common one: "How to hold down loading costs and still meet increased production demands."

At first, purchase of more of the fastest rubber-tired 2 to 2¼ Tractor Shovels available seemed the best solution. Then, local Michigan distributor, Portland Tractor Co., showed Company President J. R. Cianchette the new 6 yard Michigan. When Cianchette saw the big rig in action, he bought!

Michigan output totals 8,000 yards per 16 hour day

Today, the big Michigan truck-loads and plant-feeds over 500 yards of sand and stone *every hour*. "Despite its size, our operators would rather run this big Tractor Shovel than any other," says Mr. Cianchette. "Like all Michigans, it's well-balanced, easy maneuvering, easy operating. It has the right weight and power to handle its bucket. Its smooth operation keeps operator efficiency high all day—even though the one operator alone loads as much sand and stone as can three men on three 2 yard rubber-tired Tractor Shovels."

Excavates sub-base, loads concrete, does many similar scattered odd jobs

Such high production gives the 6-yard Michigan extra time to do all kinds of odd jobs on Cianchette's bridge, road, housing development and airport contracts. For example, it loads out broken concrete runway pavement. It has excavated for new and deeper runway and apron subbases. It backfills around new foundations, footings and slabs. Tows disabled vehicles to the service shop. Unloads trucked-in expansion tanks, reinforcing steel, metal culverts, concrete pipe. Grades haul roads on the work sites. Even loads small five and six-yard trucks with bank-run dirt . . . *needs only one pass (20 to 30 seconds) per truck.*

In all, Mr. Cianchette figures his big new Michigan has cut loading costs "more than 50%." *Perhaps 6 yard "bites" can do the same for you!* Talk it over with your Michigan Distributor before planning your next job.

Michigan is a registered trade-mark of

CLARK EQUIPMENT COMPANY

Construction Machinery Division

CLARK® EQUIPMENT

2401 Pipestone Road
Benton Harbor 2, Michigan

In Canada:
Canadian Clark, Ltd.
St. Thomas, Ontario

Their world is safer

with Fenwal DETECT-A-FIRE® units on guard

The unique ability to accurately detect incipient fire before it becomes large and difficult to control is a specifically engineered feature of DETECT-A-FIRE units. *This rate-compensation action assures positive protection no matter how fast or slow temperatures are building up to the kindling point!*

A DETECT-A-FIRE unit's heat-sensitive outer shell responds the instant it reaches a pre-set level of protection. *There's no delay for "heating through" . . . no unpredictable results inherent in fixed "rate-of-rise" devices!*

DETECT-A-FIRE units can be set for temperatures up to 725°F . . . require no resetting or replacements . . . can be widely spaced for economical installation. *They're rugged, trouble-free, reliable!*

DETECT-A-FIRE units are available in smart decorator colors to match modern interiors. Get full details on these advanced fire protection devices. Send for Bulletin MC-108. Write Fenwal Incorporated, 283 Pleasant Street, Ashland, Mass.

At the first breath of danger, Fenwal DETECT-A-FIRE units go into action, provide complete protection in schools, commercial and industrial buildings.

ANOTHER EXAMPLE OF HOW **Fenwal** CONTROLS TEMPERATURE . . . PRECISELY

Hybrid Carpentry Tool Speeds Layout Work

The Squangle is a carpentry tool made of aluminum and designed to lay out work easier. Combining several tools into one, it consists of a blade 12 in. long and 8½ in. arms forming a Tee. Level vials are set into the adjustable arm.

The Squangle will do almost everything a framing square will do, and everything a combination square and bevel will do says, Ove O. Hansen, its inventor. It will measure, plumb and indicate pitch. SQUANGLE CORP., 6306 176TH ST., S. W., LYNNWOOD, CALIF.

Truck Crane Handles 40 Tons With 40-Ft Boom

Safe load limits up to 40 tons with a 40-ft boom are handled by the Model 360T, 8x4 truck crane.

The rig, the manufacturer says, picks up, without assistance, 120 ft of boom from ground level to operating position. Pin-connected jib attachments are are available in 15- to 30-ft lengths.

A boom adapter is provided to strip the machine for road travel. The 360T is available as a 30-ton crane on a 9-ft-wide carrier, 35 ton on 10 ft 2 in., 40 ton on 11 ft. UNIT CRANE & SHOVEL CORP., 6411 W. BURNHAM ST., MILWAUKEE 19, WIS.

Portable Air Vibrator Works Almost Anywhere

A new portable air vibrator that can be attached to almost any type of frame, bin, box or table without bolts is now on the market.

The Cleveland VGV air vibrator has jaws that open to 2 in. and is attached simply by tightening the wing-bolt clamp that is part of the vibrator. The vibrator develops 3,600 vpm at 60 psi and consumes air at about 20 cfm.

The over-all dimensions of the 90-lb machine are 15 x 13 x 6 in. CLEVELAND VIBRATOR COMPANY, 2828 CLINTON AVE., CLEVELAND 13, OHIO.

Smooth Wall Piping System Added to Pipe Firm Line

Smooth wall piping systems for both underground and overhead distribution of steam, hot water, oil, process liquids and refrigeration lines are now offered by Portage Insulated Pipe Co. Accessories and fittings are included.

The system is factory prefabricated and shipped to the job site. PORTAGE INSULATED PIPE CO., 53 ANELLS AVE., BARBERTON, OHIO.

(*New Products continued p. 66*)

Normal shoot and shovel job turned over to Michigan Scrapers

19 yd pans loaded in shale-sandstone by ripper-dozer. Load time: 30 seconds

Try digging your heel into the tight shale-sandstone terrain on this 11-mile Highway 54 relocation job east of Owensboro, Kentucky—and you'd say the soil was tough enough to shoot. But a cost-conscious dirtmover—Perrin Construction Co of Cynthiana, Ky—decided to tear it up with ripper-mounted dozers, then load with high-powered scrapers. A gamble? Perhaps. But Perrin held a pair of aces—two 262 hp, 19 yd Model 210 Michigan Scrapers.

14 pay yards per trip

First step in moving the rocky material was for the ripper-equipped 200 hp dozer to slice through the borrow area. Only one or two passes were needed to break the shale-sandstone sufficiently for the Michigans—which were then pusher-loaded. Load times, with 200 hp pusher, ran from 30 to 50 seconds. Loads weighed out at 14 pay yards. Cycles were fast . . . so fast, in fact, that on hauls of less than 1,000 feet, it took both the big pusher and a 141 hp tractor to both rip and keep up with the two Model 210's. The smaller pusher, too, needed less than a minute to heap the Michigans.

14 trips per hour

In a typical three-shift period, over typical 2,000 foot one-way hauls, the two Michigans moved 10,000 pay yards. Each machine chalked up about 200 pay yards per 50-minute hour—making 14 to 15 trips over the 4000 ft cycle. Haul speeds averaged 20 mph.

Much less tire wear

According to Mr. Perrin, "The Michigans had no trouble picking up the shale. They have lots of power and payload capacity. We especially like their torque converter drive for this rough material work. It reduces wheel spin and tire wear. With ordinary scrapers, you know, an impatient operator could grind up the drive tires within a month."

Demonstrations now available

We'd welcome the opportunity to show *you* how Michigan's power shift-torque converter drive, high ratio of hp to weight, and its high capacity (three sizes: 10½, 19, 29 yards) all can combine to boost *your* production and efficiency. Call us for a demonstration—*soon*—before you bid your next job.

Michigan is a registered trademark of

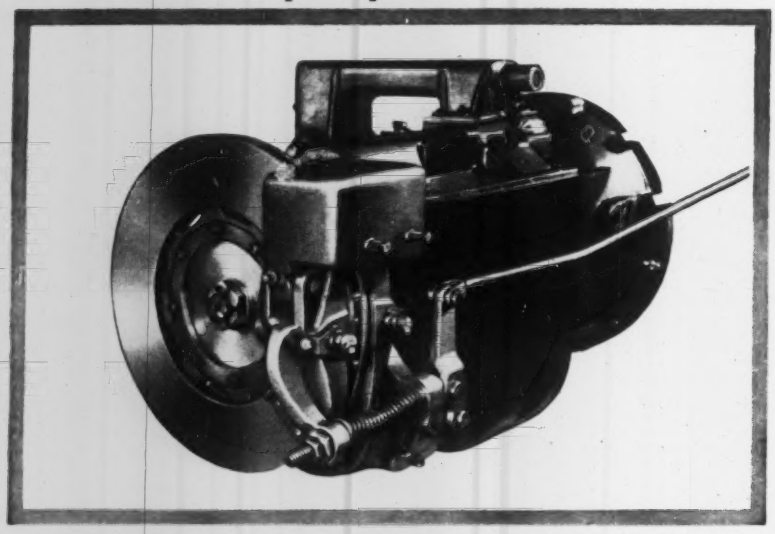
CLARK EQUIPMENT COMPANY
Construction Machinery Division

2401 Pipestone Road
Benton Harbor 5, Michigan

In Canada:
Canadian Clark, Ltd.,
St. Thomas, Ontario

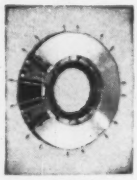
CLARK® EQUIPMENT

You Get Positive Protection Against Runaway or Parking Accidents When You Specify TRU-STOP Brakes



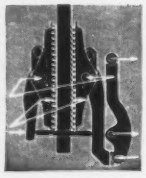
TRU-STOP brakes operate directly on the drive shaft. This means that they are not only excellent parking brakes, but dependable emergency service brakes as well. There's no dangerous self-energizing. TRU-STOP brakes have the surplus capacity for repeated use as an auxiliary to service brakes.

100% Ventilation Minimizes Fading



Brake efficiency depends on ability to dissipate heat rapidly and so prevent fading. TRU-STOP brakes are 100% ventilated. Discs are exposed to air even while braking. The TRU-STOP ventilation system circulates air *between* the disc plates.

Longer Life with Uniform Brake Pressure



The discs of TRU-STOP brakes are squeezed between the flat surfaces of the shoes. The brake lever operates both the front and rear lever arms simultaneously, and pressure is exerted on the center of each shoe. This puts the entire lining surface in contact, provides for even wear. TRU-STOP brake linings are *easy* to replace.

FOR POSITIVE PROTECTION...

Specify* TRU-STOP BRAKES *on* ANY *Heavy-Duty Equipment that Requires Braking

***WRITE* for Catalogs DH-33 and DH-530**

Automotive and Aircraft Division

AMERICAN CHAIN & CABLE

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TRADE MARK

Air, or Other Gas, Powers Instrument-Drive Unit

A self-contained air- or gas-powered instrument drive and timing, unit can be used as either original or replacement equipment in all makes and types of recording instruments.

Field tested and designed for operation in remote installations, the unit can be used with instruments requiring chart records from one hour to 30 days, including integrating orifice meters, strip-chart recorders, gas-lift meters, pressure recorders and telecounter units.

According to the manufacturer, the self-starting unit is inherently explosion proof and internally sealed to prevent corrosion or clogging. All parts exposed to gas are made from aluminum or stainless steel. It has a gas or air consumption of 5 cu ft per hour at its normal operating pressure of 5 psi.

The timing escapement spring is reportedly rewound every five seconds to eliminate fluctuating torque, and the clock accuracy is not affected by wide fluctuations in supply pressure. It is designed for mounting in any position. AMERICAN METER CO., 920 PAYNE AVE., ERIE, PA.

Tractor Shovel Cowl Slopes For Improved Visibility

A rubber-tired, four-wheel-drive tractor shovel features a sloping front cowl that gives the operator greatly improved visability. Designated the H-90 "Payloader", the machine replaces Hough's former HO model.

It is available with buckets ranging in size from 1.5 to 5 cu yd, and with either gas or diesel engines.

It can travel at average speeds while carrying a load of 9,000 lbs, has a breakout force of 21,000 lbs, and a bucket tip-back of 44° at ground level. THE FRANK G. HOUGH CO., LIBERTYVILLE, ILL.

Compressed Air Loader Fills Blasting Holes

The Jetloder, a new blow-loading machine, uses compressed air to blow fertilizer-grade ammonium nitrate and sand stemming into blast holes.

Working tests have demonstrated that the machine can blow 2¼ lb of blasting agent a second into 50- and 60-ft horizontal blast holes, the manufacturer says.

Only basic equipment needed with the Jetloder is a compressor producing at 45 psi, and sufficient 1¼-in. ID plastic pipe to reach from the machine to the back of the blast hole. ATLAS POWDER CO., WILMINGTON 99, DEL.

A step up in safety...

BLAW-KNOX Electroforged® Steel Grating and Treads

Indoors or outdoors the safe way to build a walkway is with Blaw-Knox Electroforged steel grating. Nonslip twisted crossbar provides the safest possible surface. Self-cleaning, steel grating does not collect dirt or grease . . . provides maximum open area for light and ventilation.

Designed for flexibility, one-piece construction installs easily around beams, piping, machinery or other installations. Needs no maintenance . . . nothing to wear. All surfaces accessible for easy painting.

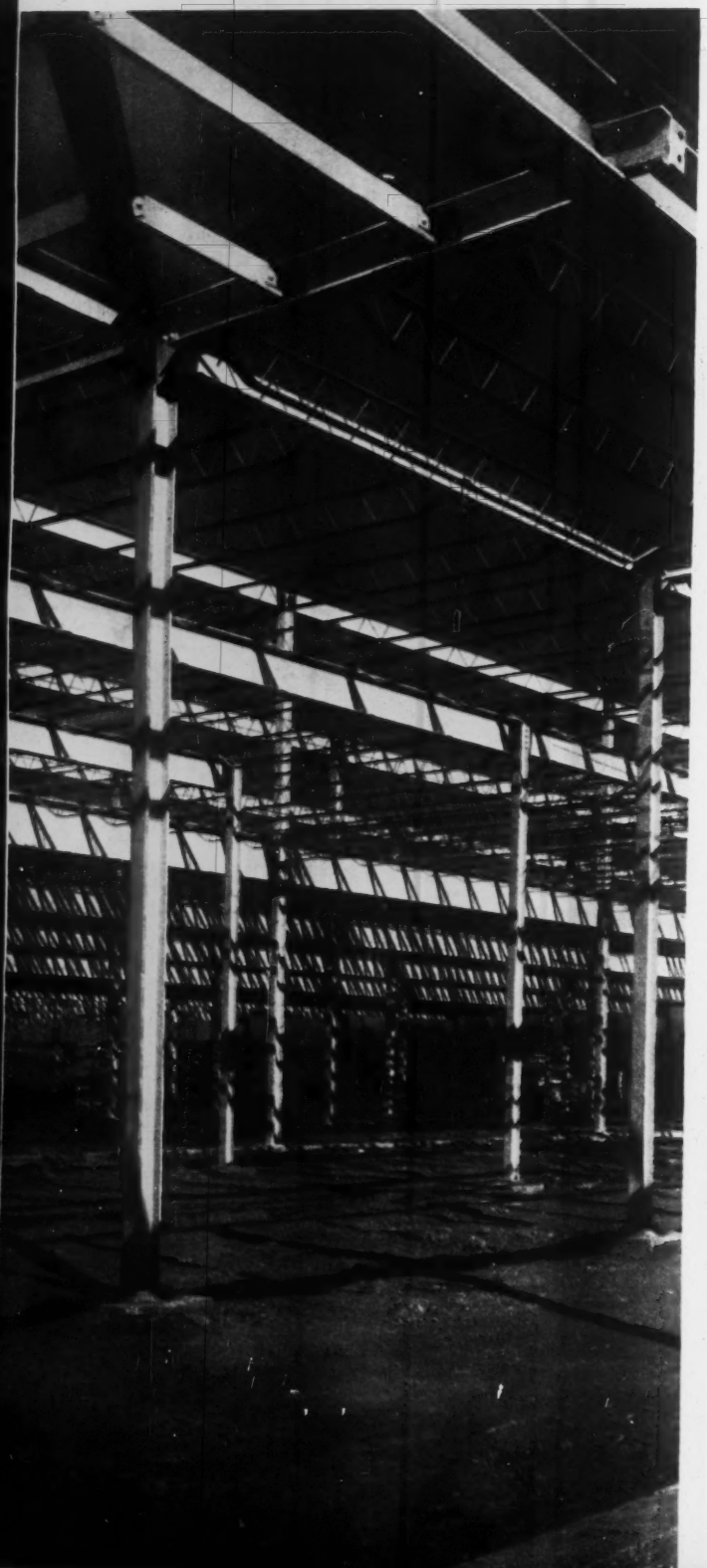
For more detailed information about how to order Blaw-Knox Electroforged steel grating and treads for your needs, send for your copy of Blaw-Knox Bulletin number 2527.

BLAW-KNOX

BLAW-KNOX COMPANY
Equipment Division
Dept. A, Pittsburgh 38, Pennsylvania

When the job calls for open-web steel joists . . .

get uniform quality by specifying



USS AmBridge Steel Joists

standard and longspan

When you order USS AmBridge, you are sure of getting the finest open-web steel joists you can buy. AmBridge Steel Joists are quality controlled through every step of manufacturing process—from furnace through fabrication. They are a consistently uniform, reliable product.

USS AmBridge Steel Joists provide rigid, economical and lightweight construction suitable for most any type of roof, ceiling and floor. Their ease and speed of erection cuts installation time, enabling you to get your structure under cover sooner. And, once they have been erected and properly bridged, they immediately form a safe working platform for other trades.

Quick Delivery

With modern production lines now in operation in Ambridge, Pa. and Gary, Indiana, we can give you quick delivery when required. When you need joists, just call our nearest Contracting Office. Your order will be promptly shipped from the point nearest your job site.

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Men and Jobs

Two Top Highway Posts Filled in Arkansas

The top positions in Arkansas' politically embattled state highway organization have been filled, and Gov. Orval E. Faubus has made his fourth appointment to the five-man State Highway Commission.

R. B. Winfrey, engineer of maintenance for the department, has been named acting director of highways. He replaces Herbert Eldridge, who resigned Jan. 5 under political pressure (ENR Jan. 15, p. 28).

Lawrence A. Blackwell has been elected chairman of the Highway Commission, replacing Glenn F. Wallace.

As a state senator in 1952, Mr. Blackwell was co-author of the Mack-Blackwell Amendment designed to take the highway commission out of politics. Approved by the voters, it was based on the assumption that no governor would be elected to a third term and be able to name a majority to the commission.

Governor Faubus' election to a third term last November broke the tradition. His fourth appointee to the commission since 1955, Armil J. Taylor, has just been sworn in.

Mr. Eldridge, who leaves the department recommended that Mr. Winfrey succeed him. Mr. Winfrey, 60, served 23 years with the Arkansas highway agency and 10 years with the Oklahoma State Highway Department.

Wesley R. Nelson Joins Architect-Engineer Firm

Wesley R. Nelson, U. S. water resources expert, who served as an executive member of the Iraq Development Board from 1952 to 1956, has joined the firm of Litchfield Whiting Bowne & Associates, New York, consulting architects and engineers specializing in foreign assignments.

He will serve as director of foreign operations, and will use the firm's office in Tehran, Iran as his base of operations.

For the past two years Mr. Nelson has been chief of the Southeast Asia Division of the International Cooperation Administration in the State Department. Before going to Iraq he was assistant commissioner, U. S. Bureau of Reclamation. He had been an engineer with the Bureau since 1922, working on numerous projects including Hoover Dam. He was chief of the Bureau's engineering division in Washington from 1937 to 1943.

(*Men and Jobs continued p. 72*)

A BOON TO TRUCK CRANE OWNERS

INCREASE YOUR MOVING CAPACITY in both Short and Long Stick operations UP to 50% • FITS ALL MAKES & MODELS OF TRUCK CRANES

ROLLING OUTRIGGERS TRADE MARK PATENT PENDING

- ALLOW NEAR-CAPACITY LOADS TO BE MOVED OVER LEVEL AND RUGGED TERRAIN
- ELIMINATE COSTLY, TIME-CONSUMING PRACTICE OF SETTING AND RESETTING OUTRIGGERS AND PADS
- ALLOW GREATER LOAD DISTRIBUTION AND PREVENT OVER-STRESSING THE CRANE CARRIER
- TANDEM, PIVOTAL ACTION WHEEL ASSEMBLY
- RUGGED CONSTRUCTION
- INSTALLED IN FIVE QUICK MINUTES

SINGLE TANDEM UNITS PER PAIR $850.00
DOUBLE TANDEM UNITS PER PAIR $1400.00

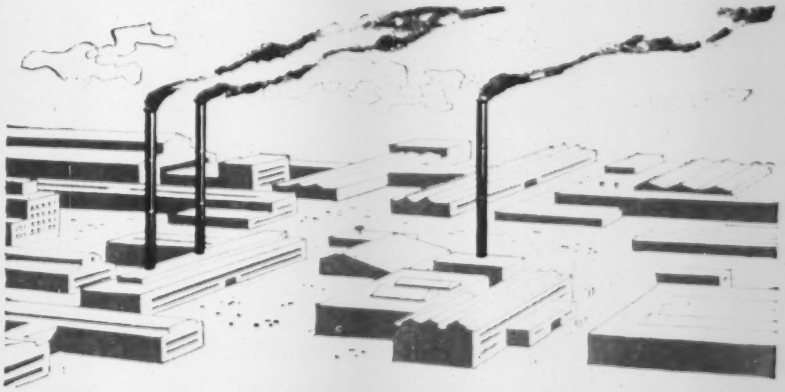
PRICES ARE F.O.B. LAS VEGAS, NEVADA

"Rolling Outriggers" Insure Mobility, Safety and Increased Profits

MANUFACTURED BY LINCOLN WELDING WORKS, INC., 1320 SO. "A" ST., LAS VEGAS, NEVADA

WRITE FOR NAME OF "ROLLING OUTRIGGERS" DEALER IN YOUR AREA

SOME EXCELLENT DEALERSHIPS ARE STILL AVAILABLE



Glass-protected stacks...

Permaglas® smokestacks are glass-protected (inside and out)... are virtually impervious to condensate corrosion

* Accelerated life tests prove that *Permaglas* stacks last 3 to 5 times longer than plain steel stacks

* *Permaglas* stacks are easy to install—no special equipment needed

Write for the money-saving facts . . . get Bulletin SS-202

Through research ...a better way

A.O.Smith CORPORATION

PERMAGLAS SMOKESTACK SALES
PROCESS EQUIPMENT DIVISION
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A. O. Smith Corporation, Dept. ENR-39, Milwaukee 1, Wisconsin
Gentlemen: Please send me a copy of the Permaglas Smokestack Bulletin No. SS-202.

Name_____ Title_____
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NEW FRUEHAUF "AIRSLIDE"* PRESSURE TANK-TRAILER

...Unloads 120 Barrels In 36 Minutes!

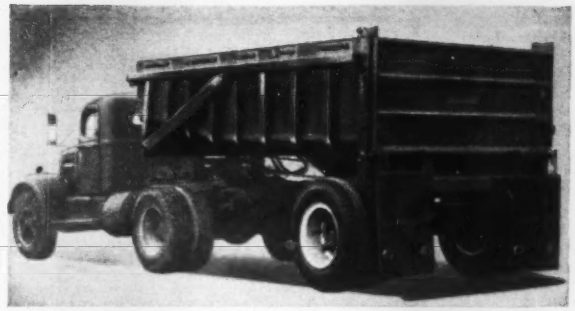
FASTER UNLOADING and lower equipment cost are the two big assets of Fruehauf's new "Airslide" Pressure Tank-Trailer for bulk cement and other powdered commodities.

This economical unit is capable of pumping aerated cement at a rate of 3.33 barrels per minute for a distance of 105 feet or more, including up to 85 feet upwards into storage elevators. The Trailer has a 105 to 120 barrel capacity, and is equally suited to many powdered solids. Pneumatic unloading through a 4-inch hose at 11 pounds pressure is accomplished either with a tractor-mounted blower connected to the power take-off shaft or with a gasoline engine mounted on the Trailer.

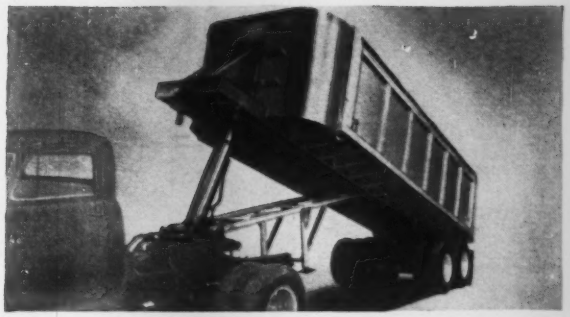
Now, unloading is easy and economical anywhere, because cross conveyors and bucket elevators are not needed with this new Fruehauf. Discharge acceleration is easily controlled manually by a wheel-type valve. For full details at once, write Fruehauf Trailer Company, 10949 Harper Avenue, Detroit 32, Michigan.

FRUEHAUF TRAILERS

*"Airslide"—Trademark, Fuller Co.

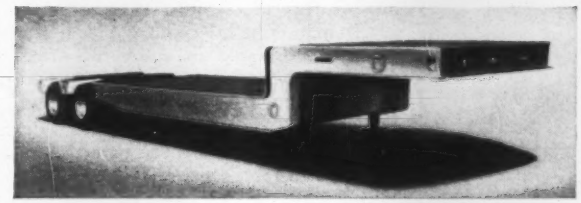


1 New Single Axle and Low-Cost Tandem Cable Dumps

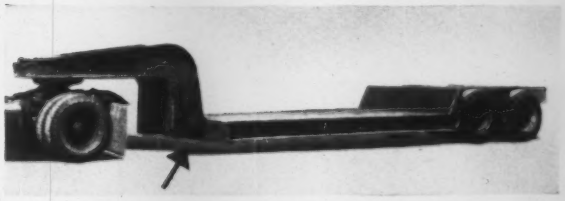


3 New All-Welded Aluminum Frameless Hoist-Type Dumps

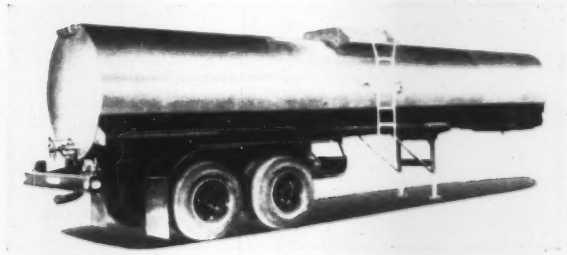
2 New Lighter-Weight, Lower Priced Carryalls



4 Fast Loading Removable Gooseneck Carryalls

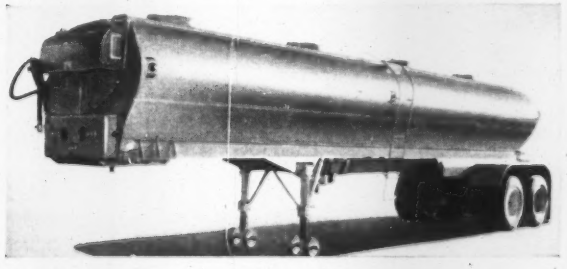


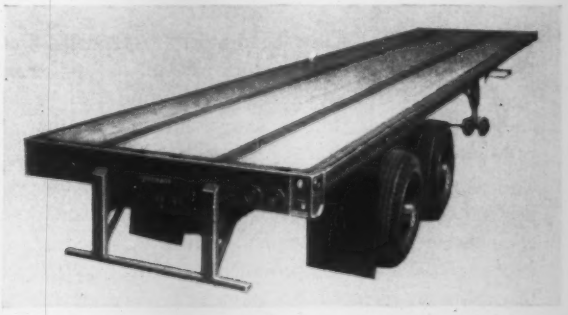
Fruehauf's New '59 Line of High Capacity Trailers Includes Every Kind of Unit Roadbuilders Need Most!



5 New Conical Steel or Lightweight Aluminum Asphalt Tanks

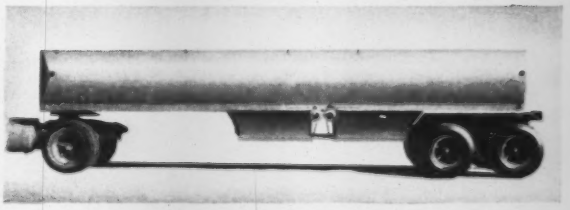
6 Screw-Type Or "Airslide"* Discharge Cement Tanks





7 Full Line of Heavy Duty Steef and Aluminum Platforms

8 Rugged, Stable Hopper-Type Dump Trailers



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1 2 3 4 5 6 7 8 ☐ NEW "Airslide" PRESSURE TANK-TRAILER

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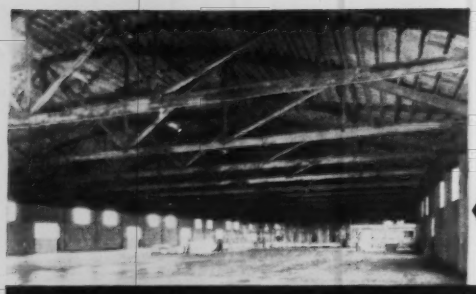

▲ Bass & Company, Inc. Warehouse in Nashville, Tenn. Trusses erected for 30c per sq. ft. Contractor: J. E. Crain & Son —Nashville, Tenn.

Wanted Economy

Demanded Beauty

RILCO

Gave Both

■ St. Joseph's Catholic Church—Yates Center, Kan., 21 Rilco beams varying in length from 4'2" to 39'.
Contr.: Berthot Construction Company—Chanute, Kan.
Arch.: Shaughnessy, Bower & Grimaldi —Kansas City, Mo.

■ The use of Rilco beams for St. Joseph's Catholic Church "was premised on cost factors as well as appearance considerations," states the architect. "We found the Rilco people very cooperative (and) despite snow and wet weather, no delay was experienced in the erection of the arches."

Contractor Berthot agreed. The Rilco structure was laminated perfectly and erected economically—"moreover, the service in the engineering department and production schedule, as well as the excellent field service provided by Rilco, contribute as much to this economy as any other item."

▲ Contractor Crain, Bass & Company warehouse builder, was also "very well pleased with the Rilco wood trusses used in the roof system, consisting of 20 bowstring trusses, 120' clear span, spaced at 16' centers.

"They were easily assembled and erected at a labor and crane cost of $122 per truss. The total material and labor cost of the truss system amounted to approximately 30c per square foot of floor area."

Rilco offers—the warmth of wood, ease of erection, increased strength, lower cost and greater fire resistance. Rilco engineers are ready to help you solve design problems and suggest new ideas. For complete information on how you can build better for less, contact your nearest Rilco Office.

RILCO LAMINATED PRODUCTS, INC.
W801 First National Bank Building
St. Paul 1, Minnesota

RILCO
works wonders with wood

DISTRICT OFFICES: TACOMA, WASH. • FORT WAYNE, IND. • NEWARK, N. J.

Pittsburgh Equipment Man Hopes to Run for Mayor

A former president of the American Road Builders Association could become the next mayor of Pittsburgh.

Paul B. Reinhold, elected president of ARBA in 1951, will enter Pittsburg's May primaries to seek the Republican nomination in the mayoralty race.

Mr. Reinhold, 69, is president and treasurer of Atlas Equipment Corp., a company dealing in industrial and roadbuilding machinery, and a director of the Fort Pitt Bridge Works. This is his first political campaign.

Careers

Business

Rollin R. Eiber has been named Chicago district manager of The Austin Co., Cleveland engineers-constructors. He succeeds Charles W. Payne, who continues as district vice president.

William B. Poor, vice president and manager of the construction department of Ford, Bacon and Davis, New York City engineering and business consultant, has been elected senior vice president.

Russell P. Westerhoff, vice president and director of Ford, Bacon & Davis, New York City engineering and business consultant, has been named chief engineer of the firm.

Stuart R. Fleming, vice president of Ford, Bacon & Davis, New York City engineering and business consultant, has been named manager of the firm's engineering department.

Farnham, Morres & Wirries is a new engineering and surveying firm formed in Toledo, Ohio. It will specialize in land-development planning, sewer systems, design of highways and airports.

Karl Koehn has been appointed assistant vice president of Hunter Construction Co., Youngstown, Ohio.

Elmer S. Barrett was elected president and chief engineer of Photronix, Inc., of Columbus, Ohio, specialists in photogrammetry and electronic computing.

John E. Davidson has been appointed assistant to C. Warren Black, president of Arundel Corp., Baltimore.

Charles W. Kreps, of Muskogee, Oklahoma has been named president of the Dickman-Pickens-Bond Construction Co., of Little Rock.

T. E. Detcher has been appointed manager of sales of the John W. Rouse Construction Corp., Gouverneur, N. Y.

Max G. Feldrappe has retired as chief engineer of the Gillmore-Olson Co., of Cleveland, after 37 years with the firm. He was in charge of the design and

construction of more than 1,000 plants.

J. Harvey Rowland, general manager and director of the Phoenix Bridge Co., of Philadelphia, has been elected president of the firm. He has been associated with the company for 40 years.

Col. Wright Hiatt, Corps of Engineers, U.S.A. (ret.), has been appointed managing engineer of the Atlantic-Gulf Division of The Asphalt Institute.

Milton Staub has been elected president and general manager of the Gustav Hirsch Organization, Inc., Columbus, Ohio.

The John Graham Co. Architects-Engineers, of New York and Seattle, announced the appointment of five partners, **Roderick Kirkwood, Henry A. Birner, Manson O. Bennett, Jack L. Follett** and **Nathan Wilkinson.**

Public Works

William H. Mitchell has transferred from his position as chief construction management engineer with the USAF Installations Representative, New England Region, to the position of chief regional engineer with the U. S. Post Office Department.

Samuel H. Probert, chief office engineer for the Oregon State Highway Department, will retire in May, 1959, after a record length of continuous service with the department. He joined the department in 1913 shortly after graduating from the University of Wisconsin as a civil engineer. His successor will be **Roderick L. Porter.**

Joseph W. Mack, 63, will resign as road commissioner and surveyor of San Diego, Calif. He has been a county employee since 1938 and has held his present position since 1947.

Associations

Ernest J. Di Sabatino has been elected president of the Allied Construction Industries of Delaware.

William K. Cogswell, vice president and secretary of the Cogswell Construction Co., Baltimore, has been chosen as the new president of the Baltimore Builders Chapter of Associated General Contractors. **Leroy E. Kirby**, executive vice president of Kirby & McGuire, Inc., was elected vice president.

Gordon L. Burt, Portland, Ore., city engineer, is the new president of the Oregon Technical Council, which acts as a professional advisory body to public agencies.

Henry Seitz, designing engineer in the Baltimore & Ohio Railroad's bridges and building department, has been elected president of the Engineers Club of Baltimore, Inc. He succeeds **William L. Chilcote**, acting highways engineer for the City of Baltimore.

and SIDING FASTENERS

The TOPSEAL System of Structural Fastening* combines Engineering Assistance with the highest quality fasteners; Power and Hand Tools; drill bits; special design sheeters sockets; and solid or "flexible flange" closure—all ready for immediate shipment. TOPSEAL* Fasteners arrive on the job with WEATH-R-SEAL® Washers assembled. Only genuine WEATH-R-SEAL® Washers have the metal and neoprene composition bonded together making a one-piece washer. So—when the fastener is driven, the sealing portion stays where it belongs—evenly distributed at the danger point where leaks must not occur. The "deflectible lip" of the neoprene composition (at inner ID) is directed into the hole sealing the fastener shank. TOPSEALS installed from the Weatherside eliminate straps, clips, and various bolts and nuts. Installation is as easy as . For new construction or maintenance—

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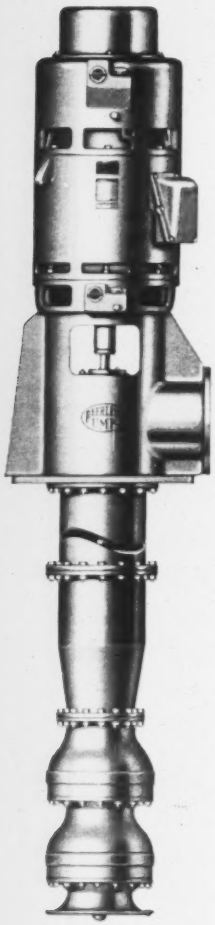

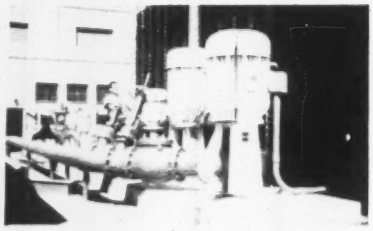

mark of distinction

As the Northwest Indians told their story with totem poles, Peerless Pump dramatizes theirs in terms of outstanding performance. An example is the Peerless vertical industrial service pump. Versatile and economical, these pumps offer excellent head-capacity characteristics, plus other measurable advantages such as: *advanced vertical turbine design* for peak efficiency, *designed-in flexibility* for adaptation to future system requirements, *vertical pump-motor design* for maximum utilization of floor space. Available in water and process liquid handling types, the Peerless vertical industrial service pump can be applied to all installations where liquids are to be transferred from short settings.

WRITE FOR BULLETIN NO. B-305

PEERLESS PUMPS

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Obituaries

Former PWA Director, Stanley Wright, Dies

Stanley H. Wright, 72, eastern branch manager of Holmes & Narver, Inc., a Los Angeles engineering firm. He had been with the California firm for the last four years.

During the depression years, Mr. Wright was director of the Public Works Administration for the State of North Carolina. Later he became regional director for the southeastern United States.

In 1939 he came to Washington to work for the Bureau of the Budget. He worked for the Atomic Energy Commission before joining Holmes & Narver.

Fred M. Graham, 87, retired research engineer of the Pennsylvania Railroad. He pioneered in dynamic stresses in railroad track and bridge structures.

Samuel T. Norton, 82, Los Angeles architect. He designed such buildings as the Fox Building, the Sinai Temple and the Wilshire Blvd. Temple.

George L. Potts, 70, whose contracting firm built the foundations for some of Baltimore's largest buildings. He was chairman of the board of Potts and Callahan Contracting Co., Inc., and president of Potts and Callahan Paving Co., Inc., Baltimore.

Louis W. Hickey, 68, a partner in Hickey & Co., Dallas, Tex., engineers and builders.

Ralph Talarico, 48, president of the Talarico Construction Corp., Herkimer, N. Y.

Fay Whitright, 69, project engineer for Division 3 of the Ohio State Highway Department, in Lodi. He had been a department member for 25 years.

Robert B. Kleinschmidt, 48, professor of the University of Buffalo engineering school vibration laboratory and former assistant professor of civil engineering at Lehigh University. He held B.S. and M.S. degrees in civil engineering from the University of Pennsylvania.

Herman T. Hagestad, 50, civil engineer in Wausau, Wis. He had been supervising construction of a new post office at River Falls, Wis.

William H. Bosier, 87, engineer active in construction of Missouri bridges, and specialist in deep foundation construction of bridges.

Architect: Weed, Russell, Johnson and Associates,
Engineer: Norman J. Dignum & Associates,
Contractor: Bradford Builders, Inc.; Miami, Florida.

Vibroflotation®

was used to compact the sandy subsoil at two National Airlines Buildings.

At Miami International Airport, the nose hangar and administration building of National Airlines are built on sand compacted by Vibroflotation.

Architect:
Weed, Russell, Johnson and Associates,
Contractor:
Fred Howland, Inc.; Miami, Florida.
Consulting Engineer:
Ammann & Whitney,
Soil Consultant:
D. M. Burmister, New York.

On two separate contracts, over 829 compactions were made to specified depth of 10 feet. Vibroflotation provided a rapid, effective, economical solution to the problem of eliminating foundation settlement.

Around this immediate area are several other buildings built on sand compacted by Vibroflotation including: American Airmotive Corporation's cantilevered hangar and Skyways Motel.

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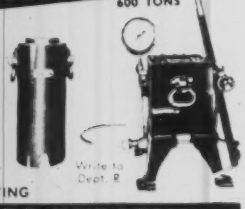

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Low excavation bid takes . . .

Road Job in Pennsylvania

The two low bidders for this state highway and bridge job in Hopewell Township, Beaver County, Pa., were less than 1% apart.

A bid of 85¢ a cu yd for 167,060 cu yd of class 1 excavation gave Ben Construction Co., bidding jointly with Allegheny Contracting Co., both of Pittsburgh, the advantage needed to take this $1.7 million contract. Other prices on this excavation ranged from $1.25, by the next to low bidder, to $2.25 a cu yd.

The work is for the Pennsylvania Department of Highways. It includes approximately 13,332 lin ft of divided highway, with 9 in. reinforced concrete pavement 24 ft wide on one side of a concrete divider, and 24 ft and variable widths on the other side; extension of four existing structures; construction of an I-beam bridge; concrete retaining walls, and low level roadway of reinforced concrete pavement 26 ft wide; and approximately 416 lin ft of crushed aggregate base course with 2-2½ in. bituminous surface course 52 ft and variable in width.

Minimum wages include: tractor operators $3.20; power shovel and crane operators $3.69; concrete paving mixer $3.69; bulldozer operator $3.49; common laborers $2.33.

1C Ben Constr. Co. and Allegheny Contr. Co., Pittsburgh — $1,685,963
2 Brayman Contr. Co., Pittsburgh; Martin W. Wise, Inc., Sewickley, Pa.; and Nick Istock, Inc., Aliquippa, Pa — 1,696,137
4 Allegheny Contr. Industries, Inc., Pittsburgh — 2,159,558

Bids: 12-30-58 Items	Unit	Quantity	Unit Prices 1C	2
Clear & grub	ls	job	$10,000	$5,000
Excavation, class 1	cy	167,060	0.85	1.25
class 2	cy	14,506	4.40	5.50
class 3	cy	910	7.00	20.00
Subgrade	sy	1,262	0.20	0.50
special	sy	95,727	0.55	0.46
Shoulders	lf	2,578	1.00	0.70
Clear existing benches & slopes of loose material	ls	job	10,000	15,000
Dispose of slide material stored on roadway	ls	job	10,000	11,200
Cr agg base crse, type A, 8"	sy	191	1.70	2.00
10"	sy	2,061	1.90	2.10
Stabilized shoulders	lf	6,626	1.00	0.70
Coarse aggregate, 2B	cy	1,276	4.00	5.00
Surfacing, selected material	cy	51	5.00	4.25
Calcium chloride	t	2	60.00	50.00
Cmt conc pavement, 6"	sy	3,115	6.00	6.55
Reinf cmt conc pavement, 9"	sy	79,120	6.00	6.15
Bit surf course, ID-2	t	39	18.00	13.00
CP-2 or FB-1, 2"	sy	13,482	1.40	1.00
ID-2, 2"	sy	40	1.60	1.40
ID-2, 2½"	sy	2,023	1.60	1.50
Concrete, cl A	cy	378	70.00	60.00
stone aggregate	cy	69	75.00	70.00
cl B	cy	4,545	47.00	46.00
Steel				
reinf bars	lb	556,564	0.15	0.13
wire fabric	lb	1,050	0.30	0.40
structural, fabricated	lb	98,020	0.24	0.16
Railing, parapet	lf	2,145	10.50	7.00
pipe	lf	18	25.00	10.00
Stone backfill for structures	cy	428	8.00	7.00
Maintain traffic	ls	job	15,000	25,000
Remov exist bri wings & parap	ls	job	3,000	650.00
wing wall	ls	job	3,000	8,610
Cmt in pressure mort buildup	bag	170	15.00	15.00
Cmt conc pave, stream beds, 6"	cy	67	30.00	60.00
12"	cy	24	30.00	50.00
Manholes, type A	ea	9	300.00	350.00
type B	ea	2	450.00	950.00
type C	ea	1	1,500	1,600
Special inlets, type 4'	ea	56	400.00	375.00
Inlets, type 6'	ea	7	450.00	450.00
type H	ea	38	400.00	450.00
type H, modified	ea	7	450.00	450.00
type J	ea	20	400.00	300.00
Cor met pipe, 36"	lf	34	15.00	12.00
asph ctd, 18"	lf	76	7.00	7.00
30"	lf	70	10.00	10.00
fully ctd, 18"	lf	450	7.50	8.35
24"	lf	158	7.30	10.00
CMP arch, asph ctd, 58"x36"	lf	90	30.00	25.00
Reinf cmt conc pipe, 18"	lf	4,522	6.00	6.00
24"	lf	84	7.75	8.50
30"	lf	96	11.00	12.00
36"	lf	86	16.00	15.50
Reinf cmt conc pipe or ext str VCP, open jts, 18"	lf	294	6.50	6.00
24"	lf	734	9.00	8.50
30"	lf	232	11.80	12.00
or perf asph ctd CMP 18"	lf	5,032	6.00	5.20
24"	lf	1,554	8.00	7.00
Vit clay pipe, 6"	lf	10	3.00	4.00
6" perf	lf	400	2.00	3.00
Pipe foundation underdrain, 6" type A, type 1 backfill	lf	11,467	2.00	2.20
type A, type 2 backfill	lf	1,524	2.00	2.20
type B, type 1 backfill	lf	5,338	2.00	2.20
type B, type 2 backfill	lf	56	2.00	2.20
Pipe underdrain outlets, 6"	lf	84	1.80	2.50
Subgrade drain	lf	200	1.80	2.00
Cmt conc gutter, type B	sy	2,066	8.00	7.50
type C	sy	4	7.00	10.00
special	sy	700	8.00	8.00
White conc reflec curb, tp A	lf	2,170	2.80	2.40
tp B	lf	23,908	3.00	2.45
Cmt conc curb, type B	lf	17,236	3.50	2.75
sidewalks	sy	4,206	6.00	5.40
Guard fence, type 1-C	lf	11,680	1.35	1.37
End anchorages, type C	ea	22	60.00	55.00
Guard fence connections	ea	2	60.00	80.00
Seeding & soil supplements Berm mixture	sy	50,000	0.06	0.04
Crown vetch	sy	100,000	0.06	0.04
domestic ryegrass	sy	50,000	0.06	0.04
Mulching, hay	sy	200,000	0.06	0.04
Crown vetch crowns, field run	ea	50,000	0.11	0.21

Completion schedule: 200 working days
Liquidated damages: $200 working day

Water Line Extended in Texas at $4.91 a Lin Ft

To extend its water line and to supply water to the State School for Children, the City of Denton, Tex. will pay $76,145 for 15,500 lin ft of 14-in. concrete cylinder water pipe, buried at an average of 3½ ft from top of pipe.

Tex-Con Utility Contractors, Garland, Tex., got the contract on a bid 1½% above the engineer's estimate. Freese & Nichols Co., Ft. Worth, is the consultant.

Concrete blocking requires a minimum of four sacks of concrete per cu yd, and a compressive strength of 1,500 psi in 28 days.

Minimum wages range from a high of $1.90 for skilled through $1.35 for semi-skilled to a low of $1.00 for common laborers.

Work started Feb. 20 and is scheduled for completion in 60 days. Liquidated damages are $50 a day.

Materials and Labor Prices

Monthly Market Quotations by ENR Field Reporters

See following ENR issues for OTHER PRICES

- Cement, Aggregate, Ready mixed Concrete, Asphalt: Last, Mar. 5; Next, April 9.
- Iron and Steel Products, pipe: Last, Mar. 12; Next, April 16.
- Wood Products, Glass, Explosives, Chemicals: Last, Mar. 19; Next, April 23.
- Wage Rates, Building Board, Lath, Insulation: Last, Feb. 26; Next, April 2.

STRUCTURAL CLAY BUILDING TILE, BRICK AND LIME—DELIVERED

	STRUCTURAL CLAY TILE PARTITION SCORED Per M; lots of 2,000 pieces or over.			STRUCTURAL CLAY TILE BEARING SCORED Per M; lots of 2,000 pieces or over.			BRICK Per M, in quantity		LIME Per ton, in paper, Carload lot.		
	3x12x12 In.	4x12x12 In.	8x12x12 In.	8x12x12 In.	10x12x12 In.	12x12x12 In.	Common backing	Straight hard	Hydrated finishing	Common hydrated	Pulverized or lump
Atlanta	$166.75*e*	$149.00*kkk*	$299.50*e*	$337.25*e*			$30.70*p*	$32.70*p*	$33.00*hh*	$25.00*hh*	$25.00*hh*
Baltimore	217.00	231.00	434.00	491.00	602.00	690.00	36.00	41.00	35.60	23.20	
Birmingham	135.00*pss*	152.00*ss*		303.00*p*	376.00*p*	465.00*p*	27.00*ff*	38.00*jj*	35.02*mm*	22.20*mm*	26.33*mm*
Boston	232.00*fmm*	248.00*fmm*	463.25*fmm*	556.00*fmm*			41.50*p*	56.50*p*	40.20*ll*	32.20*ll*	
Chicago	135.00*ll*	145.00*ll*	280.00*ll*				30.00	32.00	38.00*ll*	35.20*ll*	
Cincinnati	205.00*mmj*	225.00*mm*	296.00*jddmm*	213.00*mm*	288.00*mm*	314.00*mm*	48.75*ik*	47.00*ik*	28.00*mm*	24.50*mm*	28.00*mm*
Cleveland	200.00*tt*	213.00*tt*		438.00*tt*			40.00*tt*	43.00*pttt*	32.75*ptt*	28.00*ptt*	
Dallas	152.00	152.00	300.00	364.50	446.25	552.50	27.50	49.00	41.80	24.58	28.50
Denver							21.50*mm*	49.50*mm*	48.00*mm*	42.00*mm*	46.00*mm*
Detroit	242.00*mm*	258.00*mm*	483.00*mm*	548.00*mm*	723.00*mm*	827.00*mm*	47.50*pmm*	48.00*mm*	38.00*mm*	30.00*mm*	40.00*mm*
Kansas City	158.00*mm*	158.00*mm*	312.00*mm*	312.00*mm*	400.00*mm*	500.00*mm*	34.00*mm*	34.00*mm*	36.26	34.26	29.76
Los Angeles	*r*	*r*	*r*	*r*	*r*	*r*	35.00*uu*		38.00*mll*	38.00*mll*	39.00*mll*
Minneapolis	192.00*pe*	215.00*pe*	437.00*pe*	215.00*pmee*			45.60*mee*	54.00*ppe*	49.00*bbe*	38.00*bbe*	52.00*bbde*
Montreal	170.00*auqoo*	178.00*auqoo*	325.00*auqoo*	270.00*poo*	400.00*goo*		48.25*bll*	56.30*bll*	39.00	22.00	13.25
New Orleans	186.00	186.00	380.00	380.00			42.00	55.00	44.00	32.00	32.00
New York	180.00*h*	190.00*h*	285.00*ch*	290.00*hn*			44.00*p*		40.00*p*	37.00*p*	
Philadelphia	169.00*mm*	180.20*mm*	337.90*mm*	405.00*mm*			30.37*mm*	38.42*mm*	27.60*mm*	25.60*mm*	3.17*mmm*
Pittsburgh	200.00*t*	213.00*t*	400.00*t*	453.00*t*	602.00*t*	693.00*t*	39.00*t*	46.00*t*	38.00*t*	33.00*t*	34.00*t*
St. Louis	180.00*mmpp*	190.00*pp*	385.00*pp*	401.00*ppp*	459.00*pp*	621.50*pp*	44.00*mmpp*	45.50*pp*	1.00*kaapp*	80*aapp*	1.35*aapp*
San Francisco	156.85*mm*	177.10*mm*	235.30*ddmm*	159.40*gmm*			43.00*mm*	43.00*mm*	29.24*mm*	29.24*mm*	31.71*mm*
Seattle	235.00*pt*	270.00*pt*	490.00*pt*	265.00*pttt*			48.00*g*	62.00*g*	52.00*bbt*	38.00*bbt*	4.50*mbbt*
Toronto	158.00*rr*	173.00*rr*	336.00*rr*	263.00*rr*	378.00*rr*		35.00*rr*	63.00*rr*	37.00*as*	34.50*as*	32.50*as*

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	RED LEAD*R* Per 100 lb. In 600-lb. (Approx.) bbl. F.O.B. Plant Dry a C	WHITE LEAD Per 100 lb. In 100 lb. cases in oil	READY-MIXED PAINT Per gal., drums			ROOFING SUPPLIES; Carload lots f.o.b. factory				
			Graphite *b*	Aluminum *c*	Ferric Oxide *d*	Rolls, slate surfaced, 85-90 lb. per sq.	Asphalt felt, per 100 lb.	Tar felt, per 100 lb.	Asphalt coating per gal.	Tar pitch 360 lb. bbl. per ton
Atlanta	$13.75*ggJ*	$24.00*ggJ*	$3.59	$3.86	$3.31	$2.35*kk*	$2.15*kk*	$2.62*kk*	$0.67*kk*	$57.75*kk*
Baltimore	17.50*pp*	24.00	3.00	4.40	3.50	2.78	4.25	4.8	54.75*R*	
Birmingham	13.75*tJ*	28.65*tJ*	3.90*J*	3.40*J*		3.09*tmm*	2.29*ttmm*	2.29*ttmm*	*82ffmm*	45.00*emm*
Boston	24.05*tmmm*	26.00*tmmmR*				3.81*q*	2.56*g*	2.83*g*	.58*00g*	
Chicago	14.75*ggJ*	24.00*JR*				4.05*akk*	3.02*akk*	3.32*akk*	46.00*bkkk*	57.70*fkk*
Cincinnati	15.25*tJ*	24.00*tJR*				2.50*mm*	2.02*mm*	2.42*mm*	42.8*mm*	55.96*Hmm*
Cleveland	26.10*t*	26.90*Rt*	2.48*43gg*	3.53*1gg*	2.80*8gg*	3.29*q*	2.30*o*	2.42*o*	43.4*y*	49.00*gg*
Dallas	22.50*L*	23.50*M*		3.25*R*		3.00*u*	3.00*o*	3.00*o*	47.0	66.00*Aa*
Denver	23.00*n*	24.00	3.98	5.20	3.70	2.92	2.20*o*	2.80*o*	48*ff*	50.00
Detroit	14.75*e*	24.00*rr*	2.70*mm*	3.95*mm*	2.70*mm*	3.11*mm*	2.23*mmll*	2.42*mmll*	51*ffmm*	49.00*mm*
Kansas City	25.65*ggoo*	26.90*R*	3.99	3.43	3.01	3.58*mm*	2.61*mm*	2.61*mm*	71*y*	
Los Angeles	23.80*pp*	26.90	3.30*n*	4.50*n*	4.20*n*	3.40*nkk*	2.40*nkk*	*l*	75*nykk*	*l*
Minneapolis	15.85*e*	29.88*kk*				3.28*kk*	2.59*hkk*	2.42*hkk*	43*hkk*	50.00*rkk*
Montreal	19.45*ss*	26.00*eRtt*	5.52*Dfft*	6.55*zfft*	5.10*kfft*	5.40	4.65*f*	1.60	4.40*uu*	
New Orleans	23.00*Jpp*	24.00*J*				2.78	1.98	2.85	.680	
New York	25.65*oo*	26.90				3.10	1.87*o*	2.45*o*	438*a*	49.00*
Philadelphia	28.26*ggmm*	25.90*Rmm*	3.60*mm*	3.40/3.65*mm*	3.50/4.00*mm*	3.00/3.30	2.50*mm*	2.50*mm*	37/45*mm*	48/54*mm*
Pittsburgh	15.15*mggJ*	29.75*J*	2.20*tFJ*	2.25*tFJ*	2.25*tGJ*	3.57*tH*	2.75*tH*	2.95*H*	48*H*	55.00*H*
St. Louis	25.65*tm*	26.90				3.27*tmm*	2.39*hh K*	2.27*hh K*	42.8*p K*	62.00*K*
San Francisco	26.70*mm*	26.90*mm*	3.20*mm*	4.30*mm*	3.50*mm*	2.95*mm*	1.97*aamm*	3.10*mm*	46*ff*	54.00
Seattle	13.75*H*	24.50*ppH*		4.19*ccffJ*	3.50*J*	4.02*qccJ*	3.50*ccJ*		.55*cc*	
Toronto	14.45	19.75	5.15*J*	6.18*J*	5.95*J*	5.15	4.00*aae*	2.90*o*	1.25*f*	55.00*4*

•† Delivered. • Note: Red lead in oil 50% higher than white lead in oil. •** Aver. wt. approx. 425 to 550 lb drums. •a Red lead prices change frequently due to pig lead price changes. •b U.S. War Dept. Spec. 3-49A. •c ASTM Spec. D266-31. •d 80% minimum ferric oxide. •e Per 108 sf roll. •f Per 432 sq ft. •g F.o.b. yard Roxbury. •h Per roll, 65 lb. •i Net carload prices, Minneapolis and vicinity. •j 45 gal containers. •k Over 80% ferric oxide. •l Not used. •m 100 lb. keg. •n F.o.b. city. •o Per 60 lb roll. •p 6-drum, 50 gal each. •q Per 90-lb r ll. •r F.o.b. factory, Chicago. •s Truckload. •t Incl. Federal tax. •u Per 90-lb square. •v Per ton. •w Ready-mixed. •y 55-gal container. •z Drums. •aa 15 lb. •bb Roofers coating and cement. •cc LCL, truck delivery. •ee Asphalt pitch in 100 lb package. •ff 5-gal wt. approx. 425 to 550 lb drums. •gg F.o.b. factory. •hh Incl. freight. •ii Per 324 sf roll. •jj Asbestos roof coating. •kk less 2% disc., 10th. •mm less 2% disc., 10 days. •oo 100 lb bbls. •pp 50 or 100 lb bags. •qq 500 lbs or more del. •rr F.o.b. plant, Detroit. •ss 50 lb bbls. •tt 25 lb kegs. •uu 250 lb bbls. •A 400 lb barrels. •R ASTM Spec. D962-49. •† 95%. •D Std. black. •e Milt. spec.: E TTP27; F TTY81; G TTP31. •H less 2% disc., cash. •I Per 100 lb. •J less 1% disc., 10 days. •K add 2% sales tax. •L CL. •M 1 ton or more. •R revised.

PLASTER, VERMICULITE AND METAL BUILDING SHEETS & TUBING

	PLASTER‡		VERMICULITE‡			PERLITE‡		ALUMINUM SHEET‡		STAINLESS STEEL† SHEET-TYPE 302*g*		COPPER WATER* TUBING-TYPE L 2000 ft lots per ft	
	Neat per ton	Gauging per ton	Home Insulation pellets	Plaster aggregate	Concrete Aggregate Untreated per bag of 4 cu ft	Plaster Aggregate	Concrete Aggregate Untreated	Flat .102" th 36"x96" & 48"x144" per lb‡	Corr roof .032" th 35"x12' per sht	20 ga 48"x96 120" per cwt‡‡	28 ga 36"x120" per cwt‡‡	¾"h	½"e
Atlanta	$31.50*ss*	$37.50*ss*	$1.55*ss*	$1.65*ss*	$1.80*slss*	$1.65*ss*	$1.65	$0.141*ppp*	$8.83*n*	$65.68*zzz*	$74.43*zzz*	$16.71*zz*	$23.41*zz*
Baltimore	23.80	34.60	0.95	1.15	1.15	1.15	1.15	0.487	0.180*r*	64.70	73.45	0.1674	0.2371
Birmingham	33.00*ss*	39.00*ss*	1.55*ss*	1.55*ss*	1.80*ss*	1.55*ss*	1.55*ss*	0.458*M*	10.48*K*	67.34*K*	76.09*K*	0.1702*ss*	0.2380*ss*
Boston	22.00	30.00	1.40	1.40	1.40	1.45*ss*	1.50*ss*	0.462	9.35*p*	65.42*dd*zz*	71.92*dd*	0.1702*ss*	0.2380*ss*
Chicago	26.80*tt*	26.80*tt*	1.55	1.60	1.60*l*	1.60	1.60	0.500*z*	10.29*da*	64.15*ee*	72.40*ee*	0.1702	0.2380
Cincinnati	23.85*ss*	23.85*	1.75*ss*	1.75*ss*	1.75*ss*	1.85*ss*	1.75*ss*	0.434	9.59	65.30*zz*	74.05*zz*	0.1680*ss*	0.2315*ss*
Cleveland	28.00 V	45.00 V	1.13*ss*	1.16*ss*	1.24*ss*	1.45*ss*	1.45*ss*	0.459*ss*	8.48	65.33*mzz*	74.08*mzz*	17.03*tt*	23.80*tt*
Dallas	30.65	32.65	1.07	1.23	1.32	1.21	1.32	0.484	0.517*r*	65.00	78.00	0.1520	0.2170
Denver	27.00	27.00	1.50	1.40	1.50	1.40	1.55	0.462	10.28	65.33*yy*	76.03*yy*	0.1772	24.69
Detroit	28.00*ss*	28.00*ss*	1.27*ss*	1.31*ss*	1.40*ss*	1.43*ttt*	1.50*ttt*	0.452*a*	10.19*a*	65.15*azz*	73.90*azz*	0.2380*f*	0.27*f*
Kansas City	30.00	35.00	1.14*E*	1.18*E*	1.26*E*	1.18		0.444	23.20*ggyy*	67.50*E*	76.25*E*	17.02*f*	23.80*f*
Los Angeles	27.00*tt*	28.00*tt*	1.25*ttt*	1.20*ttt*	1.25*tt*	1.06	1.10	0.486	10.543	67.02	75.77	0.1702	0.2380
Minneapolis	35.00*F*	35.00*F*	1.55*tt*	1.70*F*	1.80*F*	1.40	1.40	0.468	16.23	65.71*G*	72.21*fG*	0.1702*f*	0.2380
Montreal	27.90*h*	35.60	1.25	1.40	1.50	1.15*p*	1.15*p*	43.95*AH*	12.10*H*	64.75*H*		0.1827	0.2160
New Orleans	34.00	48.00	1.25*P*	1.25*P*	1.25*P*	1.35*P*		0.44	8.715	71.50	72.45	0.1702	0.2380
New York	25.25	31.25	1.35	1.30	1.50	1.40	1.40	0.462*ad*	9.29*aR*	64.05*aR*	72.33*aR*	17.26*f*	24.13*f*
Philadelphia	23.25*ss*	32.00*ss*	1.35*ss*	1.35*ss*	1.40*ss*	1.05*qqss*	1.05*qqss*	0.44*ass*	9.46*ass*	66.69*ass*	75.27*ass*	15.62	21.76*f*
Pittsburgh	30.00*m*	33.00*m*	1.50*m*	1.50*m*	1.50*mm*	1.50*m*	1.50*m*	0.452	9.46	64.00	76.25*pp*	0.1702	0.1680
St. Louis	30.00*aa*	41.00*aa*	1.50*aa*	1.60*aa*	1.55*aa*	1.60*aa*	1.60*aa*	0.452	10.28	65.39*Kmm*	71.80*yaa*	17.02*fmm*	21.42*fmm*
San Francisco	29.50*ss*	30.50*ss*	1.38*ss*	1.38*ss*	1.50*ss*	1.38*ss*	1.58*ss*	0.502	9.05	67.10*K*	73.60*K*	0.1702	0.2380
Seattle	42.40*mn*	45.60*mn*	1.55*nn*	1.25*tnn*	1.85*nn*	1.50*tt*		0.513*D*	9.90*D*	67.02*D*	75.77*D*	0.1680	0.1876
Toronto	29.00	48.50	1.25	1.35	1.40	45.00*Q*		0.3995	24.75*ap*	73.74	86.52	0.2777	0.3046*an*

‡trucklots, delivered. †fob warehouse. *fob city. •a delivered. •b ½" O.D. •c ⅝" O.D. •d 0.100"th. •e 34" x 60" sheet. •f per 100 ft. •g 5 tons & up; cold roll, annal & pickled 2B finish. •h incl. Federal tax. •i add 25¢ for pint of additive. •j 1100 & 3003 alloy, mill finish. •k bag of 3 cu ft. •l treated with air entraining agent. •m 2-10M ft. •n fob mill fr equalized with nearest stocking competitor. •o 250 sacks or more. •p 100 sq ft. •q per lb. •r 30 lb bag. •s 36" x 96"; 10.81 lb sh; 48" x 144"; 21.7 lb sh. •t 19.31 lb sh. •u fob plant. •v 48" x 144" •x 0.11"th. •y 27 gauge. •aa 16M lb & up. •dd add $1.00 cwt boxing. •ee 4 tons & up. •gg add $2 cwt boxing; $0.75 cwt on skids. •hh Theoretical wt for 48" x 96"; 60.4-lb. per sh. •ii 300-bag lots. •jj 100-lb bag. •mm Theoretical wt; 19.7-lb per sh. •nn 2% cash. •oo skid packed. •pp type 304. •qq Philadelphia and suburbs. •rr less 2% disc. 15 days. •ss less 2% disc. 10 days. •tt less 2% disc. 10th. •uu add 2% sales tax. •vv Type N. •ww Per 100 sf. •xx less ½% disc. 10 days. •yy .021 ga. •zz .061" th. •A Per 100 lb. •E crated. •F 15M lb. •D less ½% for cash. •E Quantity differential. •F less 5% disc. 10th. •G less ½% disc. 10th. •H Fed. tax exempt. •K less ½% 10 days. •L 5% disc. 30 days. •M 3003; .452 for 1100. •N less 2% 15th mo. •O less $2, cash & carry. •P less 2%, 15 days. •Q per ton.

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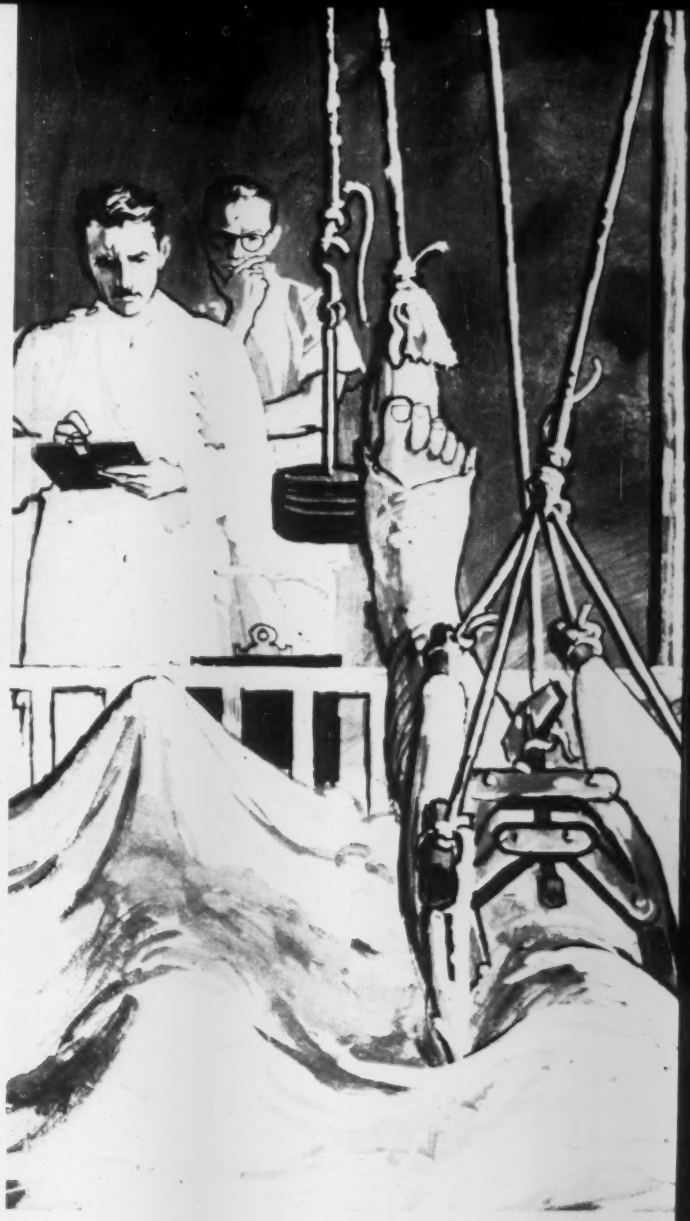

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NEW ENGLAND

BUILDINGS—BA

▲ Mass., Boston—LIBRARY, etc.—BA 4/2—Simmons College, The Fenway (selected list bidders), library and school of publication, Fenway and Ave. Louis Pasteur, $1,500,000. Campbell & Aldrich, 38 Newbury St., archts. CD 11/25.

▲ Mass., East Longmeadow—SCHOOL—BA 4/9—Town, constr. Senior High School, Maple St., $2,000,000. Plans deposit $100. Alderman & MacNeish, 594 Riverdale St., West Springfield, archts. CD 2/4.

▲† Conn., Groton—DORMITORIES—BA 4/15—U. S. Coast Guard Academy, Mohegan Ave., New London, dormitories, $1,700,000. Douglas Orr, 111 Whitney Ave., New Haven, archt. CD 1/29.

HEAVY CONSTRUCTION—LB & CA

▲ VERMONT—State Hy. Dpt., State Office Bldg., Montpelier. Bids opened 3/13.

Vt.—**Frank W. Whitcomb Constr. Corp.**, Box 429, Bellows Falls, Vt., LB $1,013,801, drainage, sub-base with b. conc. surf. course, incl. 33 ft. x 178 ft. rein.-con. box culvert town of Middlesex Int. Rte. 89 beginning approx. 2,577 mi. westerly of Montpelier-Middlesex Town Line and extend westerly 1.4676 mi. I 89-2 (4), Contr. 2, Middlesex.

Vt.—**Duncan U. Hunter**, Windsor Rd., West Claremont, N. H., LB $119,066, Center Rd. Highway relocation, Middlesex, Proj. I 89-2 (4). CD 2/16.

▲† R. R. White Contg. Co., 781 Circle Hy., Westwood, Mass., LB $2,570,000, replacement Piers 12 and 13, U. S. Naval Submarine Base, NBy-17164, GROTON, CONN. Dist. P. Wks. Office, Third Naval Dist., Federal Office Bldg., 90 Church St., New York, N. Y. Bids Mar. 10. CD 3/6.

BUILDINGS—LB & CA

▲ John Bowen Co., Inc., 173 Boston St., Dorchester, Mass., CA $2,148,274, est. $2,100,000, Contr. 58-289, ELEMENTARY SCHOOL, Cambridge St., East Cambridge, CAMBRIDGE, MASS., City, City Hall, Cambridge, Mass. Bids Feb. 17. CD 2/19, under LB.

▲ Clinton Development Corp., Commerce St., Clinton, Conn. Owner Builds. $1,250,000, 50 HOUSES, Commerce St., CLINTON, CONN. CD 12/4/57.

▲ Berkshire Builders, Inc., Brookfield, Conn., Owner Builds. $1,500,000, 150 HOUSES, Judson St. and Buddington Rd., HUNTINGTON, CONN. CD 12/13/56.

▲ George L. Hickey, Inc., 13 Spring St., Stamford, Conn., LB $4,269,890 (12 bidders) HIGH SCHOOL, STAMFORD, CONN. Bids Mar. 10. CD 3/5.

MIDDLE ATLANTIC

HEAVY CONSTRUCTION—BA

▲† Pennsylvania—BA 4/16—U. S. Eng., 24th St. and Maryland Ave., Baltimore 18, Md., flood control, Kettle Creek Dam, Susquehanna River Basin, ENG-18-020-59-8. $4,000,000-$5,000,000. CD 9/23.

BUILDINGS—BA

▲† Md., Annapolis—BANCROFT HALL—BA 4/8—Dist. P. Wks. Office, Potomac River Naval Command, Naval Gun Factory, Wash., D. C., addnl. wings Bancroft Hall (Wings 7 and 8), Naval Academy, $1,000,000. Extended date. Geo. M. Ewing, Western Saving Fund Bldg., Phila. 7, Pa., archt. CD 2/18.

HEAVY CONSTRUCTION—LB & CA

▲ Tully & Di Napoli, Inc., 127-50 Northern Blvd., Flushing, L. I., N. Y., CA $1,040,250, Contr. GWB-190.005, Sections 4 and 6 of approach roadway sys., New York (lower level expansion, George Washington Bridge, NEW YORK and NEW JERSEY, Port of New York Authority, 111 Eighth Ave., New York 1, N. Y. Bids Feb. 3. CD 2/9, under LB.

▲ George N. Brewster & Co., Inc., 275 W. Fort Lee Rd., Bogota, N. J., CA $7,840,653, Contr. GWB-190.024, approach roadway sys. for lower level expansion of George Washington Bridge between Hoyt Ave. and Hudson River, Boro of Fort Lee, New Jersey, incl. utilities therefor, NEW YORK and NEW JERSEY, Port of New York Auth., 111 Eighth Ave., New York 11, N. Y. Bids Feb. 3. CD 2/5, under LB.

▲ NEW YORK—State Dpt. P. Wks., State Office Bldg., Albany. Zone 1. Bids opened 3/12.

N. Y.—**Tufano Contg. Corp.**, 32-17 Lawrence, Flushing 54, N. Y., LB $5,554,961, est. $6,929,000 (5 bidders), c. conc. 6.11 mi. Southern State Park (Wellwood Avenue to Udalls Rd.), Contr. SSPRC 59-1, Suffolk Co.

N. Y.—**Weber Constr. Co., Inc.**, 133 Wall, Schenectady, N. Y., LB $1,188,047, est. $1,452,000 (6 bidders), b. conc. 6.6 mi. Milford-Roseboom SH 8226, Cherry Valley-Roseboom, SH 786, East Springfield-Cherry Valley, SH 934, Cherry Valley-Sharon Springs-Sharon Springs-Canajoharie Pt. 1, SH 8064, Cherry Valley-Sprout Brook Pt. 1A, Rte. 166, Contr. FARC 59-14 EASH 59-6, Proj. F-385(3), Otsego Co.;

N. Y.—**Louis Mayersohn, Inc.**, 36 State St., Albany, N. Y., LB $1,572,106, est. $1,764,000 (2 bidders), b. conc. (Type 1A) pavement 9.16 mi. Long Lake-Grove, SH 848, Newcomb Long Lake Pt. 2, SH 5189, Newcomb-Long Lake Pt. 1, SH 5188, Rte. 28N, Contr. FARC 59-15, Proj. S-210(2), Hamilton and Essex Counties;

N. Y.—**John Arborio, Inc.**, W. Cedar St., Poughkeepsie, N. Y., LB $1,742,539, est. $2,324,000 (9 bidders), b. conc. 4.27 mi., Ulster-Delaware Pt. 3, SH 31, Rte. 28, FAPC 59-17, Ulster Co.;

N. Y.—**Hornell Constr. Corp.**, 212 Main St., Hornell, N. Y., LB $1,182,912, est. $1,307,000 (5 bidders), b. conc. 2.26 mi. Hornell-Canisteo, SH 5212, Canisteo-Jasper, SH 5348, Canisteo-Whitesville, Pt. 1, SH 5537 (Rte. 36 & 248), FARC 59-11, Steuben Co.; CD 2/6.

▲ Charles F. Vachris, Inc., 1999 Park Ave., New York, N. Y., LB $4,787,500 (10 bidders), Contr. 3061, substructure shipping terminal, foot of 39th St., Gowanus Bay, Brooklyn Boro, BROOKLYN, N. Y. Comr. Marine & Aviation, Rm. 504, Battery Maritime Bldg., foot of Whitehall St. (South Ferry), New York 4, N. Y. Bids Mar. 11. CD 2/9.

▲ B. Turecamo Contrg. Co., Inc., 1752 Shore Parkway, Brooklyn, N. Y., CA $1,912,450, Contr. NYA-970.004, paving and furnishing, installation utilities for Hangar No. 17 at New York International Airport, IDLEWILD, N. Y. Port of New York Auth., 111 Eighth Ave., New York 11, N. Y. Bids Mar. 3. CD 3/5, under LB.

▲† Malan Constr. Corp., 2 Park Ave., New York 16, N. Y., LB $2,693,062, est. $3,367,371; 76A, LB $136,142, est. $269,716 (12 bidders) Phase I and Phase II, Missile Master Electronic Air Defense Facilities, Pittsburgh Defense Area, Collier Twp., Oakdale, Allegheny Co., ENG-36-058-59-20, PENNSYLVANIA. U. S. Eng., 925 New Federal Bldg., Pittsburgh 19, Pa. Bids Mar. 12. CD 2/20.

▲† Harrison Constr. Co., 1101 Western Ave., Pittsburgh 33, Pa., CA $5,647,592, Sched. B, Contr. 8J, grading, drainage, East-West Parallel Taxiway, "N" and "Z", Greater Pittsburgh Airport., PITTSBURGH, PA. Bd. Comrs. Allegheny County, Courthouse, Pittsburgh, Pa. Bids Feb. 3, awarded Mar. 3. CD 2/5, under LB.

▲ MARYLAND—State Rds. Comn., 108 E. Lexington St., Baltimore, Zone 2.

C. J. Langenfelder & Sons, 8427 Pulaski Hy., Baltimore, Md., CA $1,847,299, first phase, Northeastern Expressway—grading, drainage, surf. 3.25 mi. from Baltimore City Line to Kenwood Ave. incl. intersecting roads, 3-four span steel beam bridges near Baltimore. Contr. E-683-6-420, Baltimore Co. Bids Feb. 3. CD 2/9, under LB.

BUILDINGS—LB & CA

▲ Triumph Builders, c/o Walter Pfeiffer, archt., 109 Washington St., Morristown, N. J., CA Est. $1,400,000, 40 HOUSES, Sunset Rd., POMPTON PLAINS, N. J. Sunset Acres, c/o Walter Pfeiffer, archt., 109 Washington St., Morristown, N. J.

▲ Summit Estates, c/o Brounell & Kramer, 1478 Morris Ave., Union, N. J., Own Forces, $1,650,000, 75 HOUSES, Ashwood Ave., SUMMIT, N. J.

▲ Gifford Development Co., 383 Washington Ave., Belleville, N. J., Own Forces, $1,000,000, 26 HOUSES, Brighton Ave., UNION, N. J. Frank Farinella, 383 Washington Ave., Belleville, N. J., archt.

▲ Piracci Constr. Co., 2552 Woodbrook Ave., Baltimore, Md., LB $2,085,000 (10 bidders) Arundel JUNIOR HIGH SCHOOL, near Odenton, ANNAPOLIS, MD. Bd. Educ., Anne Arundel Co., Annapolis, Md. Bids Mar. 3. CD 2/25.

▲† McCloskey & Co., 1620 W. Thompson St., Phila., Pa., LB $10,393,000 Base Bid (18 bidders) FEDERAL OFFICE BLDG. 6, (FOB 6), WASH., D. C. General Services Admin. 18 and F Sts. N. W., Wash., D. C. Bids Mar. 13. CD 2/2;
Murphy Elevator Co., 128 East Main St., Louisville, Ky., LB $507,888 (4 bidders), elevators FOB 6, (Wash., D. C.).

SOUTH

HEAVY CONSTRUCTION—LB & CA

▲ NORTH CAROLINA—State Hy. Dpt., Raleigh.

Ballenger Paving Co., Inc., Box 927, Greenville, S. C., CA $1,154,139, grading 9.88 mi. relocation of Interstate 95 between Lumberton and St. Pauls, Proj. 8.13972 I-95-1(7)22, Robeson Co. Bids Feb. 24, awarded Mar. 10. CD 3/2, under LB.

▲† Jefferson Constr. Co., 3128 Coral Way, Miami, Fla., CA $1,998,488 pumping station, Central and Southern Florida Flood Control Project, CIVENG-08-123-59-37, FLORIDA. U. S. Eng., Box 4970, Jacksonville 1, Fla. Bids Feb. 24, awarded Mar. 12. CD 3/4, under LB.

▲ KENTUCKY—Commonwealth of Ky., Dpt. Hys., Frankfort.

Ky.—**Ruby Constr. Co. & Ruby Mining Co.**, 101 Sugg St., Madisonville, Ky., CA $1,465,170, b. conc. Class 1, 0.359 mi. North-South Expressway, I 164-6(5) 134, SP 56-798, Jefferson Co.;

Ky.—**Ralph E. Mills Co.**, 410 Ann St., Frankfort, Ky., CA $2,161,937, grade, drain, surf. 5.218 mi. Louisville-Lexington Rd. I 64-3(8)40 Shelby Co. Bids Mar. 6. CD 3/11, under LB.

BUILDINGS—LB & CA

▲ Zimken Constr. Co., 1021 5 Ave., N. St. Petersburg, Fla., Separate Contracts, $3,000,000, 294 RESIDENCES, Fairlawn Park Subdivision, ST. PETERSBURG, FLA. Rader & Assocs., 661 1 Ave. N., St. Petersburg, Fla., Engrs.

▲ Kenneth Smith Constr. Co., 219 Magnolia Ave., Daytona Beach, Fla., CA $1,866,922, Group 6, SCHOOLS, TITUSVILLE, FLA. Brevard Co. Bd. P. Instruction, Titusville, Fla. Awarded Feb. 12. CD 3/10, under LB.

▲ Ebasco Services, Inc., 2 Rector St., New York, N. Y., CA Est. exceeds $20,000,000, design and construct 225,000 kw. electric GENERATING STATION, at Little Gypsy near NEW ORLEANS, LA. Louisiana Power & Light Co., 142 Delaronde, New Orleans, La.

MIDDLE WEST

BUILDINGS—BA

▲ Ill., Chicago—HOSPITAL—BA 3/31—Bd. Comrs. Cook Co., County Bldg., Zone 2, 4 story, rein.-con. hospital, Fantus Outpatient Clinic, $3,500,000. Richard W. Prendergast, 30 N. Dearborn St., Zone 2, archt. CD 12/9.

▲ O., Parma—HOSPITAL—BA 4/9—Parma Community Hospital, 7441 W. Ridgewood Dr., hospital, $4,500,000. Geo. S. Voinovich, 1922 E. 107 St., Cleveland, Zone 6, archt. CD 2/25, under LB.

HEAVY CONSTRUCTION—LB & CA

▲† Ferber Co., 16 Johnson Ave., Hackensack, N. J., LB $1,446,577, est. $1,913,500 (9 bidders), SAC composite bldg., 46,750 sq. ft. industrial bldg., 22,650 sq. ft. operations, 1,000 sq. ft. telephone bldg., Wright Patterson Air Force Base, ENG-15-029-59-41, DAYTON, O. U. S. Eng., P. O. Box 59, Louisville 1, Ky. Bids Mar. 12. CD 3/2.

▲ ILLINOIS—Dpt. P. Wks. & Bldgs., Div. Hys., Centennial Bldg., Springfield. Bids opened 3/13.

Ill.—**Robert A. Black, Inc.**, 13912 S. Halsted St., Chicago, Ill., LB $999,790 (2 bidders) base course, wid'n. Ill. 15 north of Buford to Wayne City, Jefferson and Wayne Counties;

Ill.—**Calhoun County Contg. Co.**, P. O. Box 201, Springfield, Ill., LB $585,828 (2 bidders) resurf. 1.17 mi. SBI 1 and 145 in Metropolis, Massac Co.;

(Continued on page 82)

PROJECTS COVERED

By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger: water supply, earthwork, waterways $53,000, other public works $88,000, industrial buildings $110,000; other buildings $400,000. Also Foreign projects of $1,000,000 and more in size of Interest to American contractors.

By Regions & Classes of Construction
(In order of Listing)

BIDS ASKED
LOW BIDDERS
CONTRACTS AWARDED
New England
Middle Atlantic
South
Middle West
West of Mississippi
Far West

PROPOSED WORK
Water Supply
Sewers, Waste Disposal
Bridges
Streets & Roads
Earthwork, Waterways
Public Buildings
Mass Housing
Commercial Buildings
Industrial Buildings
Unclassified

In These Stages

PROPOSED WORK: Before and including appointment of engineers or architects.

BIDS ASKED: BA (new announcements only). For full calendar, see also preceding issues.

SOON LETS CONTRACT: SLC

LOW BIDDERS: LB On jobs below $500,000 in value all low bidder news will be the final reports published on the projects involved except where award is not made to the low bidder. In this case, a supplementary contract award report will be published.

CONTRACTS AWARDED: CA Except awards to low bidders previously reported in low bidder stage.

CD dates shown are of Construction Daily Issue in which last previous report was published.

OWNERS, ENGINEERS, ARCHITECTS, CONTRACTORS are invited to report their new jobs for listing in these reports when they meet or exceed the size minimums shown above. Address these news releases to J. A. Mahoney, REPORTS, ENGINEERING NEWS-RECORD, 330 W. 42 St., New York 36, N. Y.

Symbols and Abbreviations Include:

† Federal Government
▲ Project of $1,000,000 or over
ENR Engineering News-Record
CD Construction Daily
For additional reports see Construction Daily.

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(Continued from page 80)

Ill., LB $592,891 (3 bidders) resurf. 17.68 mi. Ill. 15, Mt. Vernon to Wayne City, Jefferson and Wayne Counties;

Ill.—McDouglas-Hartmen Co., 3101 N. Adams St., Peoria, Ill., LB $925,333 (1 bidder) paving, grade separation structure FAI-5 in Peoria, Peoria Co.;

Ill.—Orr Constr. Co., 27 E. 19th St., Chicago Heights, Ill. LB $1,950,000 (6 bidders) dual lane c. conc. paving 4.15 mi. and bridges FAI-4 near Marion, Williamson Co.;

Ill.—Quad City Constr. Co., 655 25th Ave., Rock Island, Ill., LB $710,911 (2 bidders) wid'n. FA 36, City of Quincy, Adams Co.;

Ill.—W. J. Sheppard Co., 1412 Altgeld, Chicago, Ill., LB $545,665 (7 bidders) dual concrete paving 0.34 mi. Northwest Expressway, Armitage Ave., in Chicago, Cook Co.;

Ill.—Triangle Constr. Co., 480 N. Evergreen, Kankakee, Ill., LB $1,995,800 (5 bidders) paving 5.9 mi. FA 14 near Crainville and in Marion, Williamson Co. CD 2/27.

▲† General Services Admin., 219 S. Clark St., Chicago, Ill., rejected bids Mar. 5, 2 story, 50,000 sq. ft. air traffic control center, AURORA, ILL. $4,000,000. CD 10/7.

BUILDINGS—LB & CA

▲ Zehman-Wolf & Sherman Constr. Co., 13418 Cedar Rd., Cleveland 18, O., CA Est. $4,000,000, SHOPPING CENTER (first section), PARMA, O. Parmatown, Inc., 700 Marshall Bldg., Cleveland 13, O. Weinberg & Teare, Citizens Bldg., Cleveland 14, O., and John Graham & Son, 444 5th Ave., New York, N. Y., archts. CD 1/14.

▲ Pathman Constr. Co., 1735 W. Fullerton, Chicago, Ill., CA $2,429,000, general work for new Chicago PEDRIATIC HOSPITAL, CHICAGO, ILL. Illinois Div. Architecture, Armory Bldg., Springfield, Ill. Bids Feb. 25, awarded Mar. 12. CD 3/2, under LB;
P. Nacey & Co., 927 S. State, Chicago, Ill., CA $735,000, heating, refrigeration contract for new Pediatric Hospital (Chicago, Ill.)

▲ J. Cullen Constr. Co., 305 N. Parker St., Janesville, Wis., CA $1,039,000, general contract HIGH SCHOOL, HARTFORD, WIS. Union High School Dist., Hartford, Wis. Bids Jan. 28. CD 2/3, under LB.

WEST OF MISSISSIPPI

HEAVY CONSTRUCTION—BA

▲ Wyo., Casper—BA 4/8—City, sewage treatment plant. $1,000,000. Robert Streeter, P. O. Box 2019, engr. CD 5/23/57.

HEAVY CONSTRUCTION—LB & CA

▲ MINNESOTA—State Hy. Dpt., Hy. Bldg., Capitol Grounds, St. Paul,
Johnson Constr. Co., Box 1002, Litchfield, Minn., CA $2,486,487, sand-grav. sub-base, grav. base, plant-mixed bit. surf., concrete paving and bridges (six projects in one contract), 2.8 mi. TH 494 and TH 35, Hennepin Co. Bids Feb. 27. CD 3/4, under LB.

▲ SOUTH DAKOTA—State Hys. Dpt., Pierre. Bids opened 3/13,
S. D.—Sweetman Constr. Co., 100 S. Dakota St., Sioux Falls, S. D., LB $2,769,136 (8 bidders) grading, surf., 7.54 mi. from 10th St. in Sioux Falls S. W. Proj. I 229-2 (6) 75, Minnehaha and Lincoln Counties;
S. D.—P. A. Bradbury Constr. Co., Wylie Park Rd., Aberdeen, S. D., LB $463,621 (18 bidders) grading, surf., 16.754 mi. U. S. 281 from SD 10 to Richmond Lake Rd. Proj. F 045-7(15), Brown Co. CD 2/25.

▲† Western Constr. Corp., 400 Benson Bldg., Sioux City, Iowa, CA $5,439,000, Earthwork, Stage VII, Sched. A right bank excav., left bank excav., rolled embankment, uncompacted fill barrier, levee embankment, 48 in. right bank drainage conduit, incl. exten., settlement gates, and piezometer tubes, Oahe Reservoir Proj., ENG-25-066-59-66, SOUTH DAKOTA. U. S. Eng., 1709 Jackson St., Omaha 2, Neb. Bids Mar. 4, awarded Mar. 12. CD 3/6, under LB;
Missouri Basin Constr. Co., Mitchell Air Force Base, Mitchell, S. D., CA $2,699,000, Sched. B riprap (furnish place) spalls, filter blanket (South Dakota).

▲† Malan Constr. Corp., 2 Park Ave., New York 16, N. Y., LB $12,870,000, WS-107A, operational base Squadron One Sites A, B, and C, ENG-25-066-59-49, Offutt Air Force Base, FORT CROOK, NEB. U. S. Eng., 1709 Jackson St., Omaha 2, Neb. Bids Mar. 11. CD 2/2.

▲† Blount Bros. Constr. Co., 79 Commerce St., Montgomery, Ala., CA $12,422,104, 9 launch and service bldgs., 3 launch operations, 3 power and pump houses, installing 9 generators, underground electrical sys. and misc. work at 3 Atlas Missile Launching sites near Warren Air Force Base, ENG-25-066-59-30, CHEYENNE, WYO. U. S. Eng., 1709 Jackson St., Omaha 2, Neb. Bids Mar. 4, awarded Mar. 11, Stearns-Roger Mfg. Co., 660 Bannock St., Denver, Colo., engr.-archt. CD 3/6, under LB.

BUILDINGS—LB & CA

▲† Ring Constr. Co., Metropolitan Bldg., Minneapolis, Minn., LB $3,416,000 (17 bidders), general constr. 6 story, bsmt., 147x195 ft. FEDERAL COURT HOUSE and OFFICE, Marquette Ave. between Third and Fourth Sts., Inv. No. 21901, MINNEAPOLIS, MINN. General Services Administration, 2306 East Bannister Rd., Kansas City 14, Mo. Thorshov & Cerny, 400 Metropolitan Bldg. and Lang & Raugland, Inc., Wesley Temple Bldg., Minneapolis, Minn., archts. Bids Mar. 10. CD 1/23.

▲ Lehr Constr. Co., 2115 Frederick St. Joseph Mo., LB $3,193,912, est. $3,000,000 (4 bidders), 4 story, 204-bed, irregular shape HOSPITAL, incl. CHAPEL, ST. JOSEPH, MO. St. Joseph's Hospital, St. Joseph, Mo. Bids Mar. 4. CD 2/3.

▲ Babcock & Wilcox, 1012 Baltimore, Kansas City, Mo., CA $2,596,202 (2 bidders), Contr. K-71; 425,000 lb. steam boiler Kaw POWER STATION, Extension, KANSAS CITY, KAN. Bd. P. Utilities, City Hall, Kansas City, Kan. Bids Feb. 25. CD 11/3.

▲ H. B. Zachry Co. Constr. Div., P.O. Box 10188, San Antonio, Tex., CA $4,416,415 (complete) Holly St. POWER PLANT and low water dam and bridge, AUSTIN, TEX. City, City Hall, Austin, Tex. Bids Mar. 9. CD 3/12, under LB.

▲ Hudson Engineering Corp., 2711 Danville St., Houston, Tex. CA Est. $55,000,000, gas processing and recycling PLANT, KINGSVILLE, TEX. Humble Oil & Refining Co., 1216 Main St., Houston, Tex. CD 10/21.

FAR WEST

BUILDINGS—BA

▲† Idaho, Arco—SODIUM-BOILER PLANT, etc.—BA 4/27—Atomic Energy Comn., Idaho Operations Office, P.O. Box 2108, Idaho Falls, Sodium-Boiler Plant, utilities, and facilities at Experimental Breeder Reactor No. 2, National Reactor Testing Station, $2,500,000-$3,000,000. CD 3/11.

HEAVY CONSTRUCTION—LB & CA

▲† Gordon H. Ball Co., P. O. Box 278, Danville, Calif. LB $3,934,527 (13 bidders), approx. 0.6 mi. earth levee imprvs. approx. 0.7 mi. exist. trapezoidal earth channel to be lined with concrete, 3.9 mi. rectangular concrete channel constr. access ramps, fencing and appurtenant work for San Lorenzo Creek Flood Control Proj., San Lorenzo Creek, Alameda Co., ENG-04-203-59-35, CALIFORNIA. U. S. Eng., 180 New Montgomery St., San Francisco, Calif. Bids Mar. 3. CD 1/20.

BUILDINGS—LB & CA

▲ Campion Constr. Co., 3280 Harrison Blvd., Box 686, Ogden, Utah, CA $1,840,662, HIGH SCHOOL, Washington Terrace Area, OGDEN, UTAH. Weber County School Bd., 1122 Washington Blvd., Ogden, Utah. Bids Mar. 12. CD 2/25.

▲ Tavares Constr. Co., Box 392, La Jolla, Calif. Owner Builds. $1,830,509, 166 frame, stucco DWELLINGS, Beaver Lake Dr., San Carlos Dr. and Bisley Lake Ave., San Carlos Tract No. 2, SAN DIEGO, CALIF.

▲ Bechtel Corp., 220 Bush St., San Francisco, Calif., CA Est. $4,500,000, 9,300 b/d COKING UNIT at refinery, TORRANCE, CALIF. General Petroleum Corp., 612 S. Flower St., Los Angeles, Calif. CD 1/26.

FOREIGN

HEAVY CONSTRUCTION—BA

▲† Hong Kong—BA 5/22—Secretary, Tender Bd., Colonial Secretarial, lower Albert Rd., 176 ft. high, 2,300 ft. long, 27 m.g. water a day, earth gravity dam and diversion tunnel at Shek Pik Reservoir on Lantso Island. $38,000,000. Plans deposit $420. Messrs. Binnie, Deacon & Gourley, Artillery House, Artillery Row, Westminster, London, S. W. I., archts.

▲ Portugal—Bids Asked—The Direccao-Geral dos Servicos Hidraulicos (Ministry of P. Wks.) Lisbon, 2 breakwaters, Port of Figueira da Foz. $2,100,000.

PROPOSED PROJECTS

WATER SUPPLY

▲ Ala., Huntsville—Huntsville Water & Light Bd., City Hall, water sys. Imprvs. $1,000,000.

▲ Fla., Pompano Beach—City, City Hall, water treatment plant, water mains, $2,000,000. Philpott-Ross & Saarinen, 1016 NE 7 Ave., Fort Lauderdale, consult. engrs.

▲ N. Y., Elma—Town, Town Hall, water facilities. $3,250,000.

▲ O., Middletown—City, City Hall, water lines to serve suburbs south and east of city. $1,000,000.

SEWERS, WASTE DISPOSAL

▲ Ill., Arlington Heights—Bd. City Trustees, 107 W. Davis St., bond election Apr. 4, storm sewers, $2,300,000.

▲ Ill., Metropolis—City, City Hall, sewage disposal plant, auxiliaries, appurtenances and sanitary sewers, etc., $1,050,000. Sodemann & Assocs., 37 Main St., Champaign, consult. engrs.

▲ Minn., Bloomington—Village, Village Hall, trunk sewer line service either by building own sewage disposal plant or connecting with Minneapolis disposal sys. by way of Richfield with station and gravity line (same cost for either project). $5,141,000. Orr-Schelen, Inc., 1104 Currie Ave., Minneapolis, Minn., consult. engrs. for preliminary survey.

▲ N. Y., Lewiston—Town, sanitary sewerage sys. $2,000,000.

▲ O., Canton—City, City Hall, Gambrinus Sewer Dist. No. 22, sanitary sewers, 6,444 acre tract at southwest edge of city. $1,333,000. CD 8/15/49.

▲ Tex., Harlingen—City, City Hall sewage treatment plant, $1,075,000. Freese, Nichols & Turner, C&I Life Bldg., Houston, consult. engrs. Kenneth Caldwell, c/o owner, city engr. W. Hershey, c/o owner, ass't. city engr. R. E. L. Johnson, Embee Bldg., Harlingen, res. engr. CD 10/28.

BRIDGES

▲ TENNESSEE—State Hy. Dpt., Nashville,
Loudon Co.—2,312 ft. bridge over Fort Loudon Dam with 26 ft. roadway, Fort Loudon. $2,788,000.

STREETS AND ROADS

▲ Ill., Freeport—Bd. Supervs. Stephenson Co., Court House, 5-year Highway Construction Program, 48 mi. roads and surf., blacktop 17 mi. roads, $1,648,000. George Hively, Co. Supt. Hys.

▲ PENNSYLVANIA—Pa. Hys. Dpt., 506 North Office Bldg., Harrisburg,
Cambria Co.—relocation 5 mi. roads, Glendale State Park, L.R. 11052-53 and 55, $700,000, Gannett, Fleming, Corddry & Carpenter, 600 N. 2nd St., Harrisburg, consult. engrs., W. R. Froehlich, c/o owner, act. cn. engr.
Indiana Co.—5 mi. highway, Homer, U.S. Rte 119, between Homer City and Indiana, 4 lane concrete, $3,500,000. Cozza & Critchfield, 610 Wood St., Pittsburgh, consult. engrs.

▲ Tex., Fort Worth—City, City Hall, widening paving Riverside Dr. between Ennis and Lancaster and incl. river bridge. Approx. $1,000,000. Joe J. Rady, 511 Insurance Bldg., consult. engr. CD 11/27.

EARTHWORK, WATERWAYS

▲ Kentucky—U. S. Eng., 306 Federal Office Bldg., Nashville, Tenn., 50,000 kw. power, Laurel Dam, Laurel River, Cumberland River Basin, Corbin, $30,000,000 (no appropriation).

AIRPORTS

▲ Colo., Colorado Springs—TERMINAL BLDG., etc.—City, City Hall enlarging terminal bldg., extending runways to take care of jet aircraft. $1,000,000. Ken R. White, 1567 Marion St., Denver, consult. engr.

LATIN AMERICA

▲ Argentina, Patagonia—STYRENE PLANTS, etc.—Texas Butadiene & Chemical International Ltd. subsidiary of Texas Butadiene & Chemical Corp. of Houston, Bank of Southwest Bldg., Houston, Tex., U. S. A., styrene plant, $11,000,000; butadiene plant, 30,000 ton capacity annually, $12,000,000; synthetic rubber plant, 40,000 ton annually, $10,000,000; carbon black plant, $7,000,000.

▲ Guatemala, Escuintla—PLANT—David C. Bintliff Interests, Bank of Southwest Bldg., Houston, Tex., coffee bag. mfg. plant, 40 mi. N. W. Guatemala City. $1,000,000 (Productos de Kanif South America, subsidiary to build and operate).

PUBLIC BUILDINGS

▲ Calif., Corona—SCHOOL—Corona Unified School Dist., plans by Daniel, Mann, Johnson & Mendenhall, 3325 Wilshire Blvd., Los Angeles, steel frame Corona High School, 10th and Lincoln Ave. $2,100,000.

▲ Conn., Coventry—SCHOOL—Town, Town Hall, Junior-Senior High School. $1,375,000.

▲ Conn., East Hartford—SCHOOL—Town, Town Hall, South End Junior-Senior High School addn., Forbes St. $2,000,000.

▲ Conn., Storrs—SCHOOL—State P. Wks. Dpt., 165 Capitol Ave., Hartford, Veterinary Science School, University of Connecticut, $2,000,000. CD 2/3/47.

▲ Conn., Watertown—SCHOOL—Town, Town Hall, defeated referendum Mar. 3, high school, $1,800,000. Lyons & Mather, 211 State St., Bridgeport, archts. CD 2/27.

▲ Del., Stanton—SCHOOL—Stanton School Dist., plans by Thomas M. Donohue, Marshalltown, elementary school, $1,000,000. Louis H. Doane Penna RR Bldg., Wilmington, consult. engr. CD 9/25.

▲† Idaho, Arco—SODIUM-BOILER PLANT, etc.—Atomic Energy Comn., Idaho Operations Office, Idaho Falls, sodium-boiler plant, fuel cycle facilits, utilities, etc., Experimental Breeder Reactor No. 2., $2,750,000. Bids to be called this month.

▲ Ill., Streator—SCHOOL—Bd. Educ., bond election Mar. 14, high school, $1,975,000. Bradley & Bradley, 924 N. Main St., Rockford, archts. CD 1/30/53.

▲ Iowa Mason City—SCHOOL—Bd. Educ., voted $1,350,000 bonds Feb. 10, 1 and 2 story, 105,500 sq. ft., masonry, steel frame high school. CD 1/29.

▲† Md., Beltsville—SPACE CENTER—National Aeronautics & Space Admin., 5120 H St. N.W., Wash., D. C., plans by Voorhees, Walker, Smith, Smith & Haines, 101 Park Ave., New York 17, N. Y., space center for satellite experiments. $15,000,000.

▲ Minn., Anoka—SCHOOLS—Bd. Educ., Independent School Dist. No. 11, $1,950,000 bond election Apr. 7, elementary school, $750,000. Thorshov & Cerny, Inc., 400 Metropolitan Bldg., Minneapolis, Minn., archt.; Senior High School addn., $400,000. Toltz, King, Duvall, Anderson & Assocs., 1408 Pioneer Bldg., St. Paul, archts. CD 12/17/57.

▲ Miss., Cleveland—HOSPITAL—Bd. Supervs. Bolivar Co., plans by Brewer & Skewes, 150 Delta, Clarksdale, 3 story 100-bed brick, masonry, steel, concrete hospital. $1,570,000.

▲ Miss., Gulfport—HOSPITAL—Bd. Supervs. Harrison Co., 2 story brick, masonry, concrete hospital addn. $1,227,460. Vinson Smith, 213-14 Legion Bldg., archt.

▲ Mo., Creve Coeur—SCHOOLS—Parkway Consolidated School Dist. Bd. Educ., Mason Rd. and Daniel Boone Hy., voted $1,400,000 bonds Mar. 3, Junior High

School, Woods Mill and Ladue Rd., $500,000 and school addns.

▲ Mo., Mehlville (St. Louis 25 P. O.)—SCHOOLS—School Dist. R-9, Bd. Educ., 3200 Lemay Ferry Rd., Zone 25, voted $1,115,000 bonds Mar. 3, schools, incl. 3 story Mehlville Senior High School addn., 3200 Lemay Ferry Rd.; Over $400,000. William B. Ittner, Inc., 911 Locust St., St. Louis, Zone 1, archt.-engr. CD 2/10.

▲ N. J., Bernardsville—SCHOOL—Somerset Hills Regional High School Dist., referendum Mar. 31 on proposed regional dist., constr. and bonds, high school addn., $2,000,000. Ernest Brown, 7 Watchung Ave., Plainfield, archt.

▲ N. J., Hackensack—SCHOOL—Bd. Educ., plans by Charles Cleveland, 214 Main St., high school, Prospect Ave. and Third St., $2,000,000. CD 2/4.

▲ N. J., Jersey City—SCHOOL—City, City Hall, plans by Zeigler, Childs & Paulsen, 921 Bergen Ave., elementary school, Gates Ave., $3,000,000. CD 10/9/56.

▲ N. J., Morristown—HOSPITAL—Bd. Trustees Morristown Memorial Hospital, Madison Ave., plans by Ferrenz & Taylor, 152 W. 42 St., New York, N. Y., 9 story hospital addn., alterations, two 4 story addns., $4,000,000. CD 6/18.

▲ N. J., Point Pleasant Beach—SCHOOL—Bd. Educ., Boro of Point Pleasant Beach, plans by Harold M. Klausz, 35 Cooper St., Woodbury, high school addn., Trenton Ave., $1,250,000. (Correction—architects address). CD 1/29.

▲† N. J., Trenton—ACCESSORY TEST FACILITY—Fourth Naval Dist., Phila. Naval Base, Phila., Pa., plans by Burns & Roe, 160 Broadway, New York, N. Y., accessory test facility at Naval Air Turbine Test Station, $2,000,000. CD 1/15/54.

▲ N. Y., Buffalo—SCHOOLS—Bd. Educ., 801 City Hall, plans by Albert Rumschik, 263 Linwood Ave., elementary school addn. to School No. 8, $500,000, CD 7/11; plans by James Meadows & Howard, 250 Delaware Ave., Junior High School No. 91, $2,000,000. Frank Sheehan, Linwood Ave., Buffalo, N. Y., consult. engr. CD 6/6.

▲ N. Y., Grand Island—SCHOOL—Grand Island School Bd., high school, $2,750,000.

▲ N. Y., Oceanside—SCHOOLS—Bd. Educ., approved referendum vote Mar. 3, school bldg. program, incl. grade-junior school and 3-school addns., $4,900,000. Knappe & Johnson, 2110 Northern Blvd., Manhasset, and Andrew Fritz, 241 Sunrise Highway, Rockville Center, archts. CD 2/9.

▲ N. C., Beaufort—SCHOOLS—Carteret Co., Bd. Educ., Beaufort, (1) West Carteret High School, $1,000,000, (2) East Carteret High School, $1,000,000.

▲ O., Cincinnati—SCHOOL—Bd. Educ., 608 E. McMillan, plans by Edw. J. S. Schulte, 920 E. McMillan, 1 story brick Carson-Whittier elementary school addn., $750,000; plans by Pepinsky, Grau, Schrand & Shoer, Walnut and 4th, Clifton Elementary School addn., Clifton Ave., $500,000; plans by Carl Strauss, Rockwood Pl., East Avondale Elementary School, $750,000; plans by Glaser & Meyers, 5945 Ridge Ave., 1 story brick Peaslee Elementary School addn., Sycamore and Woodward Sts., $700,000; plans by Potter, Tyler, Martin & Roth, L 28 E. 6th St., 1 story brick Second Madisonville Elementary School, $600,000; plans by A. M. Kinney, Inc., 2412 Vernon Pl., Northwest Senior High School, $2,850,000; plans by James E. Allan, 3307 Clifton, Silverton Elementary School, $750,000; plans by Garriot & Becker, 2414 Grandview Ave., 2 story brick Winton Terrace Elementary School, $950,000. CD 11/10; plans by Cordes, Pressler, Houck & Assoc., 4939 Paddock, 2 story brick Eden Junior High School, $1,800,000. Albert Buenger, 4939 Paddock Rd., engr. CD 2/28/55.

▲ O., Independence—SCHOOL—Bd. Educ., 6565 Brecksville Rd., bond election June 2, High school, $1,550,000. (Ward, Conrad, Schneider & Szaba, Hanna Bldg., Cleveland, Zone 15, archts. CD 2/11.

▲ Okla., Tulsa—CIVIC CENTER—City, City Hall voted $7,500,000 bonds Mar. 3, civic center auditorium, $7,482,000. CD 1/26.

▲ Ore., Corvallis—SCHOOL—Corvallis School Dist., plans by Annand, Boone & Lei, 1530 SW Taylor, Portland, Junior High School, $1,585,000.

▲ Tex., Carrollton—SCHOOL—Carrollton Ind. School Dist., voted bonds Feb. 28, high school $1,000,000. Junior High School, $950,000. Elementary School, $475,000; converting high school into Junior High School, $525,000. CD 2/26.

▲ Tex., Hurst-Euless—SCHOOLS—Hurst-Euless Ind. School Dist., plans by Stanley Brown, archts.-consult. engrs., 4012 Cedar Springs Rd., Dallas, Junior High School, $1,000,000; Elementary School No. 1, $425,000; Elementary School No. 2, $575,000. CD 1/7.

▲† Virginia—TEST STATION—Procurement Office, Langley Field, plans by Daniel, Mann, Johnson & Mendenhall, archts.-consult. engrs., 3325 Wilshire Blvd., Los Angeles, Calif., test station for experimental rockets, Wallops Island, $5,000,000.

▲ Wash., Seattle—SCHOOL—Shoreline School Dist. E. 158 St. and 20 Ave. NE, voted $300,000 bonds Mar. 3, high school, $2,500,000. Mallis & De Hart, Lyon Bldg., archts. CD 1/16.

▲ Wis., Menomonie—SCHOOL—Bd. Educ., plans by Foeller, Schober, Berners, Safford & Jahn, 310 Pine St., Green Bay, Grade, Junior and Senior High Schools, $2,205,000-$2,270,000. CD 8/1.

▲ Wis., Milwaukee—SCIENCE—University of Wisconsin, Madison, plans by Grellinger & Rose, 767 N. Broadway, Zone 2, 4 story, second floor science bldg., and two 1 story wings, $2,200,000. Bids about July.

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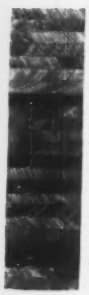


Division Offices in Ramsey, N. J., Schiller Park, Illinois, Dallas, Texas
District Representatives in Major Cities Throughout the United States
Affiliated Company: Timber Structures, Inc. of California, Richmond

MEMBER A.I.T.C. AND PRODUCERS' COUNCIL

COMMERCIAL BUILDINGS

▲ **Calif., Azusa**—DWELLINGS—C&M Homes, 705 W. Foothill Blvd., plans by S. Jack Henderson, 705 W. Foothill Blvd., 146 frame, stucco dwellings, north of 11th St. on Pasadena Ave. Tract 18063. $1,500,000.

▲ **Calif., Los Angeles** — OFFICE — Arthur Gilbert & Edward Rothschild, 333 S. La Cienega Blvd., plans by Daniel, Mann, Johnson & Mendenhall, 3325 Wilshire Blvd., 13 story, 240,000 sq. ft., rein.-con. office, Wilshire Blvd. and Parkview St. $4,000,000. American Cement Corp., lessee.

▲ **Calif., Pomona**—NURSING UNIT—Pomona Valley Community Hospital, plans by J. Dewey Harnish, Eugene W. Fickes, Jr., 222 E. "B" St., Ontario, 6 story, rein.-con. nursing unit, $1,500,000. Bids 6-8 months, CD 4/30/57.

▲ **Calif., Van Nuys**—HOSPITAL—Valley Presbyterian Hospital, 15107 Van Owen St., plans by Wm. Pereira & Assoc., preliminary archts., 1231 W. 5th St., Los Angeles, 3 story, bsmnt., rein.-con., 100-bed hospital addn. $1,400,000.

▲ **D. C., Wash.**—MARKET CENTER—Southwest Market Center, Inc., 500 12 St. S. W., plans by E. W. Dreyfuss, 1019 15 St. N. W., market center, "E" 6th and 2nd Sts. S. W. $1,000,000. Henry Dollar & Assocs., 2000 K St. N. W., consult. engrs.

▲† **Fla., Winter Park**—APARTMENTS—E. J. Gurney & Lester Kafer, c/o J. G. Rogers & Lovelace & Fritz, archts., 145 Lincoln Ave., 12 three story apartments, Virginia Inn. $1,500,000.

▲ **Ga., Atlanta**—OFFICE—Bank of Georgia, 34 Peachtree St. N. W., plans by Hedrick & Stanley, archts.-engrs., 904 Fort Worth Ave., Dallas, Tex., 31 story office, Peachtree and Walton Sts. $10,000,000.

▲ **Ill., Chicago**—SCHOOL, etc.—Bishop Anderson Foundation, 738 S. Marshfield Ave. (a) parochial elementary school (b) church (c) religious foundation bldg. and swimming pool, bounded by Polk, De Kalb, Lexington and Hoyne Aves. $1,500,000.

▲ **Ill., Chicago**—HOSPITAL—Michael Reese Hospital, 29 St. and Ellis Ave.,
6 story Cummings research pavilion, 2912 Ellis Ave., $1,550,000.
services bldg. (engineering, electrical shops, storage and incineration) $1,000,000.
3 story Florsheim memorial interns residence addn., $415,000.
Michael Reese bldg. modernization, $500,000.
kitchen and elevator modernization, $400,000.

▲ **Kan., Kansas City**—AGRICULTURAL HALL OF FAME—Agricultural Hall of Fame, c/o Howard A. Cowden, Co-op., North Kansas City, Mo., plans by Jos. W. Radotinsky, 1401 Fairfax Trafficway, Kansas City, Kan., Agricultural Hall of Fame, $5,000,000.

▲ **La., Baton Rouge**—SHOPPING CENTER—Circle Center Corp., c/o Bodman & Murrell, archts., 1175 Nicholson Dr., 500,000 sq. ft. shopping center, $10,500,000. Lathrop Douglass, 518 5th Ave., New York, N. Y., assoc. archt.

▲ **Md., Wheaton**—HOSPITAL—Sisters of the Holy Cross, Eastern Ave. and Bunker Hill Rd. N.E., Wash., D. C., plans by Faulkner, Kingsbury & Stenhouse, Ring Bldg., Wash., D. C., hospital, Forest Glen Rd. and Georgia Ave. $3,000,000.

▲ **Mich., Warren** — SHOPPING CENTER — Tech Plaza, Inc., c/o Charles N. Agree, Inc., archt., 14330 W. McNichols, Detroit, 16 story shopping center, Tech Plaza. $1,000,000. Bids in Spring.

▲ **Mich., Warren**—MOTEL, etc.—Van Dyke Motor Lodge, c/o Paul Tilds Assocs., Inc., archt., 1021 Livernois, Detroit, 55,000 sq. ft. motel, swimming pools, $1,200,000. Herman H. Feldstein, Spitzer Bldg., Toledo, O., assoc. archt.

▲ **Minn., Bloomington (P.O. Minneapolis)**—DEPARTMENT STORE—Bloomington Development Co., & T. Milviss, Title Insurance Bldg., Minneapolis, plans by M. Morris & Assocs., 103 West 47th St., Kansas City, Mo., 100,000 sq. ft. department store called "Govt. Employees Mart, Inc.", southwest corner E. 78th St. and Cedar Ave. $1,000,000. Maveron Eng. Co., 1216 Nicollet Ave., Minneapolis, consult. engr.

▲ **Minn., Minneapolis**—STORE—Atlantic Mills Corp., 111 8th Ave., New York, N. Y., 1 story, 100,000 sq. ft. store, 78th St. and Nicollet Ave. $1,000,000.

▲ **Nev., Las Vegas**—HOTEL—Tower Hotel Corp., (Max Field), 3473 W. 8th St., Los Angeles, Calif., plans by Stiles & Robert Clements, 210 W. 7th St., Los Angeles, Calif., 10 story 1200 room hotel, parking for 4,000 cars. $15,000,000.

▲ **N. Y., Brooklyn**—HOME FOR AGED—Roman Catholic Diocese of Brooklyn, 75 Greene Ave., Zone 5, plans by Beatty & Berlenbach, 32 Court St., Zone 2, 5 story Home for the Aged alterations, 1 Prospect Park West. $2,250,000.

▲ **N. Y., Evans**—SHOPPING CENTER, etc.—Mrs. Dorothy Arcangel Evans, 15 store shopping center, incl. 85 homes, Lake St. and Erie Rd. $2,500,000. Rezoning needed.

▲ **N. Y., New York**—APARTMENT—14 Mosholu Corp., 655 Whittier St., Zone 59, plans by H. Herbert & Clarence Lillien, 1841 Broadway, Zone 23, 6 story apartment, westside of Broadway between Mosholu Ave. and 259th St. $1,000,000.

▲ **O., Amherst**—HOMES—Lake Breeze Development Co., Lake Breeze and Ferndale, Lorain, 150 homes, Annis Rd., South Amherst. $1,875,000.

▲ **O., Cincinnati**—HOUSES—Parr & Butler Constr. Co., Jaconica Dr., Greenhills, 250 one story, bsmnt. houses off Hamilton Ave. $4,500,000. Gordon R. Neal & Assoc., 2323 Park, engrs.

▲ **O., Columbus**—MOTEL—Holiday Inns of America, 887 Rayner St., Memphis, Tenn., 108-room motel, southwest corner W. Broad St. and Grener Rd. $1,000,000.

▲ **O., Copley**—SHOPPING CENTER—Copley Shopping Center, c/o Paul & Wilbur Emery, 2830 Copley Rd., 19-unit shopping center, Copley and Jacoby Rds. $1,500,000. Hope to start in about 2-3 months.

▲ **O., Dayton**—HOSPITAL—Children's Hospital Society of Dayton, 1000 Runnymede, 150-bed children's hospital. $3,750,000.

▲ **O., Youngstown**—HOMES—Boardman Enterprises, Inc., c/o Leonard Oravetz, 4638 Euclid, luxury home development, 90-acre site, Boardman Twp. between Mathews Rd., Boardman-Canfield Rd., Southern Blvd. and South Ave. $2,000,000.

▲ **Pa., Horsham**—SHOPPING CENTER—6-11 Discount Dpt. Store, Inc., and Easton Road Development Co., Inc., c/o I. David Pincus, 1325 Walnut St., Phila.; plans by Thomas J. Mangan, Fort Washington, shopping center Easton Rd. $1,500,000. CD 1/6; under Shop-A-Rama, as owner.

▲ **Pa., Phila.**—APARTMENT—Jules Hopman, Inc., Stenton Ave. and Washington Lane, apartment, Wynnefield Ave. $2,000,000.

▲ **Pa., Pittsburgh**—HEADQUARTERS—William Penn Fraternal Assn., Verhovey Bldg., 20 story headquarters of William Penn Insurance Bldg., Grant St. between 3rd and 4th Aves. $6,000,000.

▲ **S. C., Charleston**—RESIDENCES—Plantation, Inc., c/o Ford & Griffeth Realty Co., 1311, Highway No. 61, 350 residences, West Ashley Subdivision. $7,000,000.

▲ **Tenn., Nashville**—MOTEL—First Mortgage Co. of Nashville, Inc., 410 Union St., motel $1,500,000.

▲ **Alta., Calgary**—HOTEL—Warner Holdings Ltd., c/o Atkugov & Sunderland, archts., 909 15th St. S.W., Corral Hotel, 17th Ave. and 2nd St. E. $1,000,000.

▲ **Man., Winnipeg**—APARTMENTS—Owner, c/o Libling, Michener & Assocs., archts., 301-138 Portage Ave. E., 9 story, 6 penthouse apartment, Roslyn Rd. $2,000,000.

INDUSTRIAL BUILDINGS

▲ **Calif., San Carlos**—PLANT—Lenkurt Electric Co., Inc., 1105 County Rd., plant. $1,500,000. Constr. 1959.

▲ **Calif., South Gate**—PLASTER MILL, etc.—Fibreboard Paper Products Corp., 475 Brannan St., San Francisco, Zone 19, plaster mill, warehouse.

▲ **Ind., Gary**—GRAIN ELEVATOR—Acme Evans Div., General Grain Co., 902 W. Washington St., Indianapolis, grain elevator, Burns Ditch, near here. $3,500,000.

▲ **Ind., Gary**—STEEL MILL—Midwest Steel Co., Div. of National Steel Corp., Grant Bldg., Pittsburgh, Pa., steel mill, Burns Ditch. $100,000,000. Taking bids on survey and core drilling. Albert J. Berdis, Grant Bldg., Pittsburgh, Pa., engr.

▲ **La., New Orleans**—PLANT—Owens-Illinois Glass Co., Owens-Illinois Bldg., Toledo, O., 150,000 sq. ft. multi-furnace glass container plant, Inner Harbor Industrial Canal.

▲ **Mich., Dearborn**—COLD ROLLING MILL, etc.—Ford Motor Co., 3000 Schaefer St., 75,000 sq. ft. cold rolling mill addn., 4 soaking pits, slab reheating furnace and 4-stand tandem cold rolling mill, etc., at steel plant. $35,000,000.

▲ **Minn., Minneapolis**—PARKING GARAGE—First National Bank of Minneapolis, 5th St. and Marquette Ave., 700-car parking garage, incl. two floors below street level and four or five levels above, Fifth St. and Second Ave. South. $1,000,000.

▲ **Miss., Tupelo**—PLANT—Pennsylvania Tire Co. sub. Mansfield Tire & Rubber Co., Mansfield, O., tire mfg. plant, Industrial Park, North Tupelo. $1,500,000.

▲ **N. Y., New York**—PARKING GARAGE—U. S. Parking Corp., 120 Broadway, Zone 5, 10 story parking garage, Whitehead St. from Bridge to Stone Sts. $2,000,000. Gage & Martinson, 145 E. 49th St., Zone 17, engrs. CD 12/31.

▲ **B. C., Vancouver and Vancouver Island**—TERMINAL—Canadian Pacific Railway, C. A. Colpitts, ch. engr., 355-360 McGill St., Montreal 3, Que., four railway terminals, 15,000 sq. ft. office space, 38,000 sq. ft. terminal space, equipment. $1,000,000.

▲ **Ont., Port Maitland**—PLANT—Electric Reduction Co. of Canada Ltd., 147 Wellington St. W., Toronto, chemical plant, Lake Erie. $5,000,000. A. D. Margison & Assocs., Ltd., 30 Eglinton Ave. E., consult. engrs.

UNCLASSIFIED

▲ **Ala., Huntsville**—ELECTRICAL POWER SYS.—Huntsville Water & Light Bd., City Hall, electric power system imprvs. $1,000,000. CD 6/26/57.

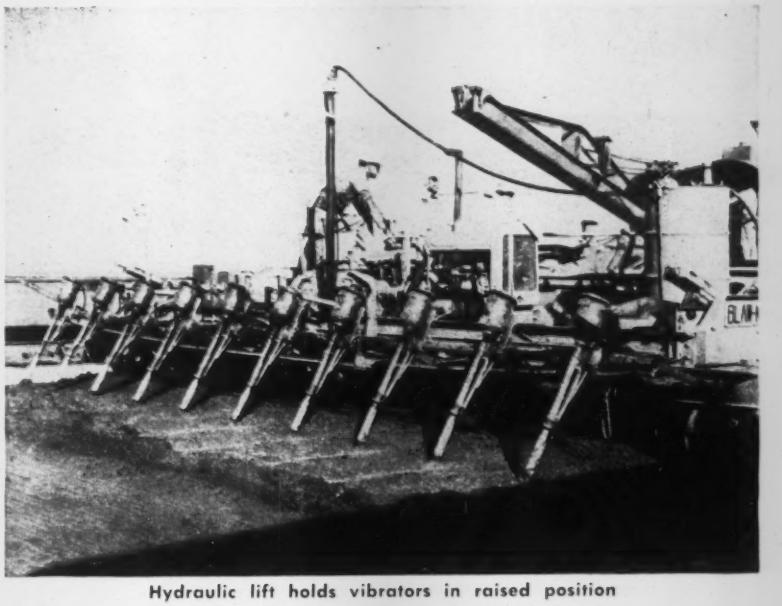
▲ **Ala., Huntsville**—NATURAL GAS SYS.—Huntsville Water & Light Bd., City Hall, natural gas sys. imprvs. $1,000,000. CD 3/12/58.

▲ **Colo., Colorado Springs**—STADIUM—Air Force Academy Foundation, 40,000 seat football stadium, Air Force Academy. $3,000,000.

▲ **O., Sandusky**—DOCKAGE FACILITIES, etc.—Dr. Harrison W. Pratt & Assoc., 415 Central, dockage facilities, restaurant, boatel, swimming pool, 47 acre area adjoining East Battery Park. $2,000,000.

▲ **Rhode Island**—MISQUAMICUT BEACH—State R. I. & Prov. Plants, Div. Purchase, State House, Providence, development of Misquamicut Beach, incl. bathing pavilion and parking area, Westerly. $1,000,000. Charles A. Maguire & Assoc., Turks Head Bldg., Providence, consult. engrs. Constr. 1959. CD 11/21.

GANG VIBRATOR Assembly Delivers Faster, Large Area Vibration



Hydraulic lift holds vibrators in raised position

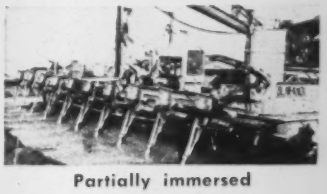
Today, more and more specifications demand full depth, internal vibrations for thick concrete slabs. In airport runways, especially, with the increased use of jet planes, slabs must be thick and extremely strong. Naturally, to get ultimate strength, slow slump concrete must be poured and internally vibrated.

To keep pace with these new requirements, Stow has developed a Gang Paving Vibrator Assembly that is designed to internally vibrate even the stiffest concrete as fast as the spreader moves. The Stow Assembly is adjustable for depth and spacing of the vibrators, provides complete vibration regardless of the specifications for the particular slab. Vibrators are attached by brackets to a tubular mounting frame controlled by hydraulic cylinders which, by rotating the toolbar, raise and lower the vibrating heads. Power for the vibrators is furnished by a generator. The complete Assembly can be attached to a concrete spreader, or mounted on a special trailer towed behind the spreader.

For vibrating only next to the side forms, which some specifications require, two Stow hand-lever-controlled Assemblies are mounted at the ends of the concrete spreader to thoroughly vibrate the concrete next to the forms.

For more details, write for Stow's pamphlet, "Gang Vibration" which gives complete information including the number and size of vibrators for different width slabs.

Stow also makes a complete line of concrete vibrators, rotary trowels, concrete grinders and vibrating screeds.



Partially immersed

Totally immersed

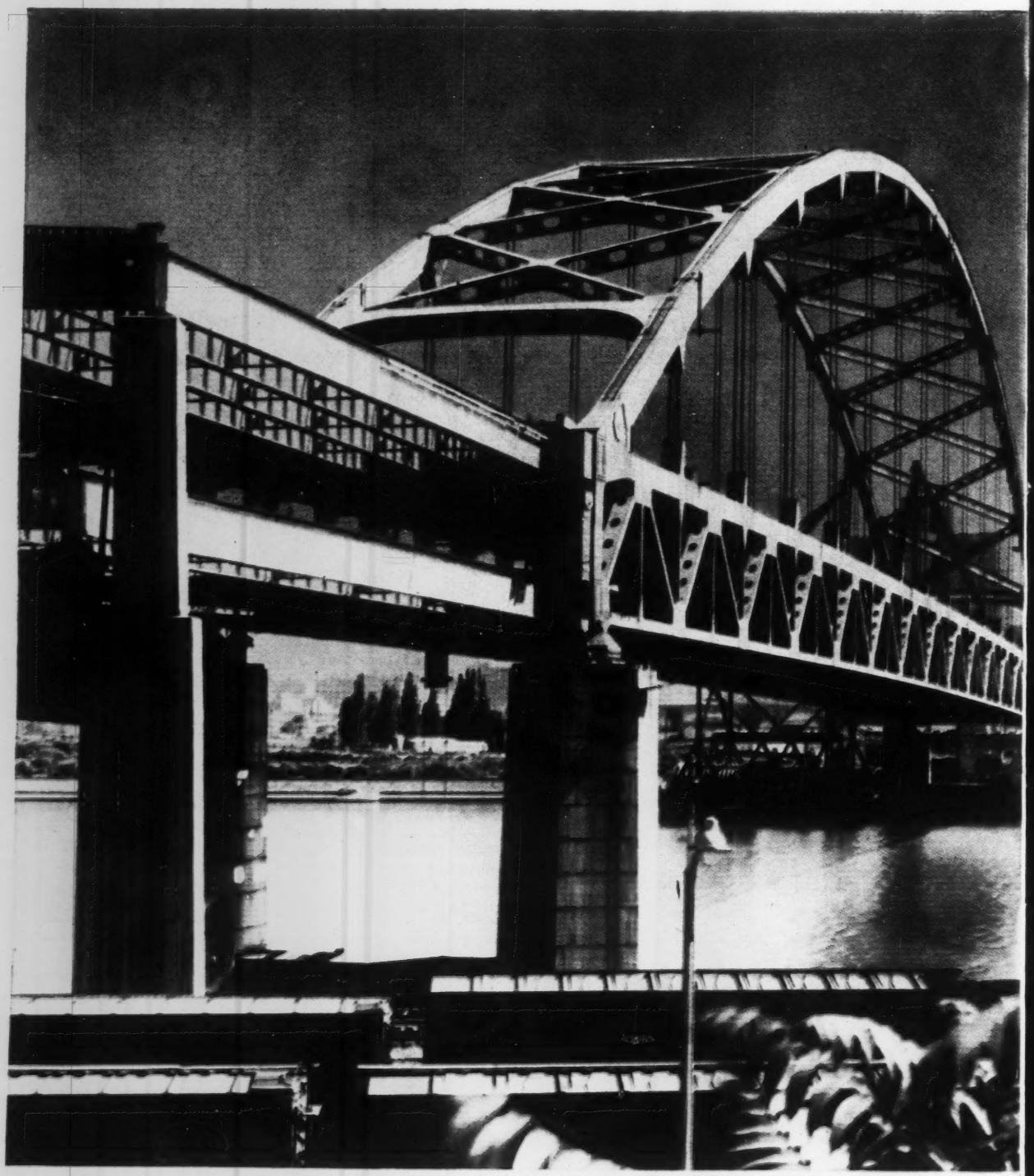
STOW MANUFACTURING CO.
Dept. L-1, 19 Shear St., Binghamton, New York
Please send me your pamphlet "Gang Vibration".

Name .....
Company .....
Street .....
City ..... State .....

STOW MANUFACTURING CO., Dept. L-1, 19 Shear St., BINGHAMTON, NEW YORK

Only span of its kind in the world . . .

New Fort Pitt Bridge built with cost-saving



USS MAN-TEN High-Strength Steel

Under the shiny new paint on Pittsburgh's Fort Pitt Bridge is a steel with a reputation—USS MAN-TEN High-Strength Steel. More than two-thirds of the 8,000 tons of steel used in the 750-foot span is USS MAN-TEN brand—a steel that delivers high strength (50,000 psi min. yield point) with economy.

The bridge is regarded by engineers as the most unusual structure in the entire Penn-Lincoln Parkway System. It is a double-deck, tied-arch design and will carry four lanes of one-way traffic on each level.

For the heavily stressed members, high-strength steel answered the problem of getting higher allowable stress per dollar by avoiding unnecessary weight. USS MAN-TEN Steel was used in all chords, most diagonals and verticals, and all portal members including end floor beams. The roadways are supported by 112 pre-stressed USS Tiger Brand suspender ropes, each 3¼" in diameter with an ultimate strength of 475 tons.

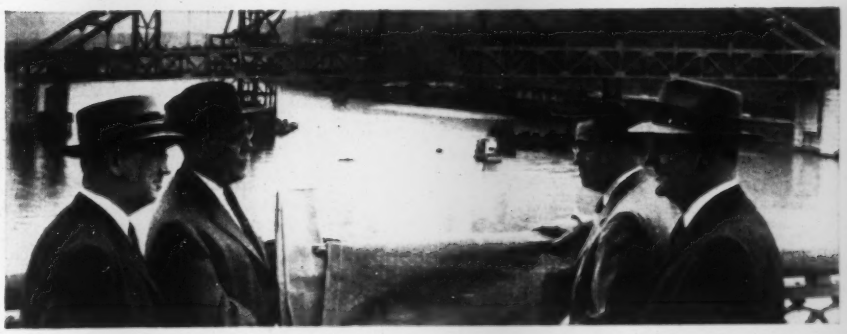
Other USS High-Strength Steels available for construction include USS TRI-TEN High-Strength Low-Alloy Steel which, like USS MAN-TEN, has a minimum yield point of 50,000 psi and which is particularly recommended for welded structures. USS COR-TEN High-Strength Low-Alloy Steel also has a 50,000 psi minimum yield point and, because of its outstanding resistance to atmospheric corrosion and superior paint adherence qualities, is a "natural" for riveted structures located in corrosive areas. Where an extra high yield strength steel is needed, we offer USS "T-1" Constructional Alloy Steel which combines weldability and toughness with 100,000 psi minimum yield strength.

For complete information on any of these steels, write United States Steel, 525 William Penn Place, Pittsburgh 30, Pennsylvania.

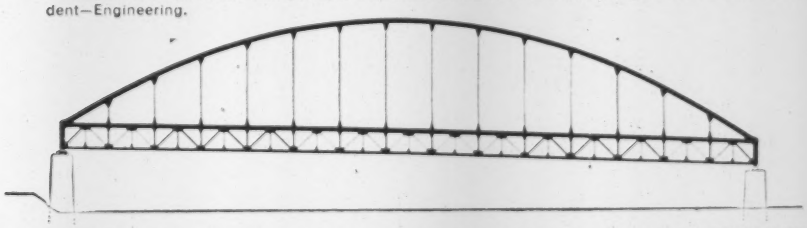
USS, MAN-TEN, COR-TEN, TRI-TEN, "T-1" and TIGER BRAND are registered trademarks

United States Steel Corporation—Pittsburgh
American Steel & Wire—Cleveland
Columbia-Geneva Steel—San Francisco
Tennessee Coal & Iron—Fairfield, Alabama
United States Steel Supply—Steel Service Centers
United States Steel Export Company

United States Steel



Some of the men who played major roles in making the new Fort Pitt Bridge at Pittsburgh a reality: left to right are Alan A. Porter, American Bridge Division's Vice President—Construction; George S. Richardson, consulting engineer, designer of the bridge; Leonard J. Curran, District Engineer, Pennsylvania Department of Highways; and Arthur S. Marvin, American Bridge Division's Vice President—Engineering.



Where high-strength steel saves money. Profile of bridge showing parts made of USS MAN-TEN Steel in heavy lines. For these members, MAN-TEN Steel's high strength and relatively low cost made it the economical steel to use.

Bids—Low Bids—Contracts—Second Section

NEW ENGLAND

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
BRIDGES
April 1 Massachusetts
STREETS AND ROADS
March 31, April 7, 8 Massachusetts
April 8, 10 Vermont

BUILDINGS—BA

▲ Mass., Wayland—SCHOOL—BA 3/31—Town, high school, Old Conn. Path, $2,300,000. Plans deposit $75. Extended date. The Architects Collaborative, 63 Brattle St., Cambridge, archts. CD 3/2.

▲ N. Y., Maine—SCHOOL—BA 4/2—Maine-Endwell Central School Dist. No. 1, elementary school, $1,250,000. Plans deposit $50. Perkins & Will, 55 Church St., White Plains, archts. Garfinkel & Marenburg, 100 W. 42nd St., New York, engrs. CD 12/9.

HEAVY CONSTRUCTION—LB & CA

▲† Nat Harrison, 5137 N.E. Second Ave., Miami, Fla., LB $10,144,000 (domestic steel) LB $9,544,000 (foreign steel), radiation sys. Naval Radio Station, Washington Co., JONESPORT, ME., Dist. P. Wks. Office, First Naval Dist., 495 Summer St., Boston, Mass. CD 9/8.

▲ CONNECTICUT, State Hy. Comm., 170 Douglas St., Hartford. Bids opened 3/16.
Savin Brothers, Inc., Cottage Grove Rd., Bloomfield, Conn., LB $1,674,997 (10 bidders) reinforcing paving 7.283 mi. relocation Rte. 8, Campville to Rte. 116, Proj. 65-67, Harwinton and Litchfield. CD 2/26.

BUILDINGS—LB & CA

▲ Greater Meredith Development Corp.; Dr. Charles J. Cataldo, Box 253, Center Harbor, N. H. Owner Builds. Est. $2,140,000, HOUSING DEVELOPMENT, RESIDENCES and SHOPPING CENTER, MEREDITH, N. H. B. C. Gallo, 409 Chelsea St., East Boston, Mass., archt. Warren M. Campbell, 238 Court Rd., Winthrop, Mass., engr. CD 7/30.

▲ Gilbane Bldg. Co., 90 Calvery St., Providence, R. I., CA Est. $4,000,000, AUTOMATIC POST OFFICE and MAIL PROCESSING BLDG., PROVIDENCE, R. I. Intelex Systems, Inc., Div. International Telephone & Telegraph Co., 22 Thames St., New York, N. Y. CD 2/27.

▲ Alphage Ferland & Sons, Inc., Armistice Blvd., Pawtucket, R. I., CA Est. $2,000,000, SHOPPING CENTER, Diamond Hill Rd., WOONSOCKET, R. I. Walnut Hills Plaza, Inc., c/o Charles G. Everett, archt., 74 Baptist St., Pawtucket, R. I. Alfred Kozai, 7 Dyer St., Providence, R. I., assoc. archt.

▲ George L. Hickey, Inc., 13 Spring St., Stamford, Conn., CA $4,271,390, HIGH SCHOOL, STAMFORD, CONN., Town Purch. Agt., City Hall, Stamford, Conn. Bids Mar. 10. CD 3/16, under LB.

▲ Brownleigh Acres, Simsbury Rd., West Hartford, Conn., Owner Builds, $2,150,000, 100 HOUSES, "Brownleigh Acres", WEST HARTFORD, CONN. CD 3/7/56.

MIDDLE ATLANTIC

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
STREETS AND ROADS
April 2 New Jersey

BUILDINGS—BA

▲ N. J., Carteret—PLANT—BA 3/30—Continental Can Co., Fibre Drum Div., 100 E. 42 St., New York, N. Y., 225,000 sq. ft. plant, Blair Rd. and Turnpike, $5,000,000. Walter Kidde, Inc., 140 Cedar St., New York, N. Y., engr. CD 12/1.

▲† N. J., Fort Monmouth—HOUSING—BA About 3/31—U. S. Eng., 111 E. 16 St., New York 3, N. Y., 130 unit Capehart Housing, $1,500,000-$2,000,000. CD 4/2, under LB.

▲† N. Y., Romulus—HOUSING—BA About 3/31—U. S. Eng., 111 E. 16th St., New York, Zone 3, 120 unit Capehart housing at Seneca Ordnance Depot, $2,000,000. CD 3/3, under LB.

▲ D. C., Wash.—HEADQUARTERS—BA 4/8—American Trucking Assns., Inc., 1424 16 St., N.W., selected list of bidders, headquarters, "P" St., N.W., between 16 and 17 Sts., $2,000,000. Ghiaterian, Gauger & Nolan, 1642 K St., N.W., archts. CD 12/2.

HEAVY CONSTRUCTION—LB & CA

▲† Arundel Corp., 334 Furman Ave., Brooklyn, N. Y., CA $1,578,721, dredging and rock removal to depth of 37 ft. below mean low water involving removal 81,900 cu. yd. place measurement of rock and 75,900 cu. yd. place measurement of material other than rock from New York and New Jersey Channels, Sect. 4, Rock Area 14, CIVENG-30-075-59-35, NEW YORK and NEW JERSEY, U. S. Eng., 111 E. 16th St., New York 3, N. Y. Bids Mar. 5. CD 3/9, under LB.

▲ NEW YORK—State Dpt. P. Wks., State Office Bldg., Albany.
Slattery Contg. Co., Inc. & Slattery Tunnel Corp., 46-36 54th Rd., Maspeth 78, N. Y., CA $7,851,047, initial 1.32 mi. section new six-lane divided Clearview Expressway (58th Ave. to 35th Ave.) Rte. 495, FICE 59-1, Contr. No. 2, Proj. I-1112 (10), Queens Co. Bids Feb. 19. CD 2/20, under LB.

▲ Charles F. Vachris, Inc., 9024 Ditmas Ave., Brooklyn 36, N. Y., LB $4,787,500 (10 bidders) Contr. 3061, substructure, shipping terminal, foot of 39th St., Gowanus Bay, Brooklyn Boro., BROOKLYN, N. Y. Comr. Marine & Aviation, Rm. 304, Battery Maritime Bldg., foot of Whitehall St. (South Ferry), New York 4, N. Y. Bids Mar. 11. (Correction—contractor's address.) CD 3/16, under LB.

▲ Transportation Corp. of America, 36 and M St., N.W., Wash., D. C., CA $1,592,000, paving and widening roadway, Rhode Island Ave. between Logan Circle N.W. and 4 St., S.E., WASH., D. C. Div. Govt. Dpt. Hys., 499 Pa. Ave., N.W., Wash., D. C. Bids Feb. 24. CD 2/26, under LB.

BUILDINGS—LB & CA

▲ Colmar Constr. Co., 364 Gold St., Brooklyn 1, N. Y., LB $1,617,000, general contract PUBLIC SCHOOL 100, Lafayette Ave. between Taylor and Thierot Aves., Bronx Boro., NEW YORK, N. Y. Bd. Educ., Bureau Constr., 42-15 Crescent St., Long Island City 1, N. Y. Bids Mar. 18. CD 2/13.

▲ Depot Constr. Corp., 42-15 Crescent St., Long Island City 1, N. Y., CA $7,195,000, general contract MEDICAL SURGICAL BLDG., incl. service connections at Bronx State Hospital, NEW YORK, N. Y. Bureau Contracts, Dpt. P. Wks., State Office Bldg., Albany, N. Y. Bids Jan. 28. Grand total $9,687,470. CD 2/2, under LB:
Louis Rosenman, Inc. & Rose Heating Corp., 112 Fourth Ave., New York 3, N. Y., CA $958,000, heating work for Medical Surgical Bldg., Bronx State Hospital (New York, N. Y.).
Heimler Elec. Service, 1052 2nd Ave., New York, N. Y., CA $880,470, electrical work for Medical Surgical Bldg., Bronx State Hospital (New York, N. Y.).
S & M Plumbing Co., Inc., 601 W. 26th St., New York, N. Y., CA $654,000, sanitary work Medical Surgical Bldg., Bronx State Hospital (New York, N. Y.).

▲ Lehman & Watson, 71 North Main St., Freeport, N. Y., CA Est. $3,000,000, HOSPITAL, PLAINVIEW, N. Y. Plainview Hospital, c/o Gloster & Gloster, archts., 253 Sunrise Hy., Rockville Center, N. Y. CD 3/6.

▲ Frank E. Antolick & Sons, Inc., Schaghticoke, N. Y., LB $2,336,000 (12 bidders) general contract 5 bldg. CAMPUS, Hudson Valley Technical Institute, TROY, N. Y. Bd. Supervs. Rensselaer Co., Court House, Troy, N. Y. Bids Mar. 11. CD 3/6.

▲ Richlin & Klass, 11 Ave., Highland Park, N. J., CA $2,500,000, eight 2 story, 208-unit APARTMENTS, Aurora St., HIGHLAND PARK, N. J. Orchard Gardens, Inc., 243 Hansbury St., Newark, N. J. CD 8/19/57.

▲ Glenwall Co., Hy. 46, Saddle Brook, N. J., CA $2,298,000, 4 story HOSPITAL addn., RIDGEWOOD, N. J. Bd. Trustees Valley Hospital, Linwood Ave., Ridgewood, N. J. CD 2/16, under LB.

▲ Piracci Constr. Co., 2552 Woodbrook Ave., Baltimore 17, Md., CA $2,085,000, 1 and 2 story masonry Arundel JUNIOR HIGH SCHOOL, near Odenton, ANNAPOLIS, MD. Bd. Educ. Anne Arundel Co., Annapolis, Md. Bids Mar. 3. CD 3/16, under LB.

▲ Henry A. Knott, 2406 Greenmount Ave., Baltimore 18, Md., CA $1,983,000, masonry, steel, concrete DIAGNOSTIC CENTER, Patuxent Institute (Criminal Insane), JESSUP, MD. State Dpt. P. Imprvts., 506 Park Ave., Baltimore 1, Md. Bids Feb. 5. CD 2/10, under LB.

▲ Charles Mullan, 12 E. 36th St., New York, N. Y., CA Est. $1,900,000, steel APARTMENT, 11 Slade Ave., PIKESVILLE, MD. Slade Inc., 11 Slade Ave., Pikesville, Md.

SOUTH

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
BRIDGES
March 31 North Carolina
STREETS AND ROADS
March 31 North Carolina April 3 Kentucky

▲† Va., Langley Air Force Base—BOMARC FACILITIES—BA 4/21—U. S. Eng., foot of Front St., Norfolk, Zone 1, BOMARC facilities, consisting of following:
(1) 28 launcher storage bldgs. on piling 62 ft. x 23 ft. with ramp to 36 ft. x 11 ft., site, City Newport News.
(2) 92 ft. x 69 ft. central utilities bldg.
(3) 80 ft. x 140 ft. assembly and maintenance bldg.
(4) 41 ft. x 28 ft. acid handling plant, masonry bldg.
(5) 80 ft. x 50 ft. on piling J. P. Fuel Handling Plant, metal bldg. and several buried tanks.
(6) 18 ft. x 40 ft. rein.-con. ordnance storage.
(7) 50 ft. x 54 ft. GAT masonry on spread footing bldg., site midway between Lee Hall and Yorktown.
(8) misc. metal bldgs.
(9) 2,400 ft. 6 ft. wide x 4 ft. high concrete pipe tunnel with metal arch roof.
(10) electrical distr. and communications sys.
(11) water distr. sys., incl. 150,000 gal. elevated tank.
(12) sanitary sewer collector sys. and sewage treatment plant.
(13) roads and hardstands.
(14) chain link fence (6,600 plus ft.) ENG-44-110-59-31, $5,000,000. CD 3/16.

▲ Ala., Birmingham—BA 5/5—Industrial Water Bd., City Hall, industrial water sys. imprvs., Sipsey Fork, Warrior River to Birmingham, $16,350,000. Plans deposit $75. J. W. Goodwin Engineers, 2111 7th Ave. S., engrs. CD 9/12/56.

BUILDINGS—BA

▲† Va., Fort Lee—CAPEHART HOUSING—BA About 3/31—U. S. Eng., P.O. Box 119, Norfolk, 285 unit Capehart Housing, (No. 3), $4,000,000. CD 3/3, under LB.

▲ Ga., Decatur—HOSPITAL—BA 4/2—DeKalb Co. Hospital, 126 Trinity Place West, DeKalb Co. General Hospital, North Decatur Rd. and Lawrenceville Highway, $2,500,000. Plans deposit $100. Bothwell & Nash, 206 Roswell St., Marietta, archts. CD 7/24/58.

HEAVY CONSTRUCTION—LB & CA

▲ Western Kentucky Gas Co., 608 Frederica, Owensboro, Ky., Own Forces, $1,700,000, gas service expansion facilities, Hardinsburg, and storage facilities, Owensboro, KENTUCKY.

BUILDINGS—LB & CA

▲ John McShain, Inc., 3501 Sinclair Lane, Baltimore, Md., CA $8,827,000 (8 bidders) AGRICULTURE-ENGINEERING, MORGANTOWN, W. VA., West Virginia University, Bd. of Governors, Morgantown, W. Va. Bids Mar. 3. CD 3/9, under LB.

▲ Alexander & Kingbay, Inc., 5603 Kyndale Ave., South Minneapolis, Minn., CA $2,700,000, SHOPPING CENTER, Hy. 27 and Montevallo Rd., BIRMINGHAM, ALA. N. W. Walters, Sr., 3839 Canawa Rd., Birmingham 3, Ala. CD 1/6.

▲ Martin L. Adams & Sons, 512 W. Ormsby Ave., Louisville, Ky., Owner Builds. Over $2,500,000, 197 HOMES, Klondike Acres, LOUISVILLE, KY.

▲ F. W. Owens Co., 119 N. 5th St., Louisville, Ky., CA Est. $2,500,000, 6 story, 80 x 130 ft. glass facade, brick BANK and PARKING GARAGE, 406-416 W. Jefferson, LOUISVILLE, KY. Liberty National Bank, 207 Market St., Louisville, Ky. Wagner & Potts, 419 Fincastle Bldg., 3rd & Broadway, Louisville 2, Ky. and Bank Bldg. Corp., 1130 Hampton Ave., St. Louis Mo., archts. E. R. Ronald & Assoc., 554 S. 3d St., Louisville 2, Ky., engrs. CD 12/11.

MIDDLE WEST

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
STREETS AND ROADS
April 8 Michigan

BUILDINGS—BA

▲ Mich., Kalamazoo—SCHOOL—BA 3/31—Bd. Educ., 7 story, 205,000 sq. ft. steel frame, concrete high school, $3,500,000. Extended date. Perkins & Will, 309 W. Jackson Blvd., Chicago 6, Ill., archts. CD 1/14.

▲ Ind., Indianapolis—STATE OFFICE—BA 4/15—State Office Bldg. Comm., Old Trails Bldg., 309 Washington St., state office, $15,000,000. Graham, Anderson, Probst & White, Inc., and Raymond S. Kastendeick, 201 N. Wells St., Chicago 6, Ill., archts. (Correction—architects). CD 3/4.

BUILDINGS—SLC

▲ Ill., Chicago—PLANT—Libby, McNeill & Libby, 200 S. Michigan Ave., Zone 4, soon lets contract 1 story, 600,000 sq. ft. concrete brick meat packing plant, Ashland Av. and 115th St., $10,000,000. A. Epstein & Sons, 2011 W. Pershing Rd., archts. CD 11/7.

HEAVY CONSTRUCTION—LB & CA

▲† Erickson & Lindstrom Constr. Co., 308 Sill Bldg., Flint, Mich., CA $1,861,411, operations, industrial and warehouse bldgs., incl. utilities, Kinross Air Force Base, ENG-20-064-59-45, KINROSS, MICH., U. S. Eng., 1101 Washington Blvd., Detroit 26, Mich. Bids Feb. 25. CD 2/18.

BUILDINGS—LB & CA

▲ Knowlton Constr. Co., Box 348, Bellefontaine, O., LB $2,114,000, general contract 1 and 2 story, structural steel frame HIGH SCHOOL, NEWARK, O. School Dist., Newark, O. Bids Mar. 11. CD 2/25:
Gesling Co., 121 S. Columbus Ave., Lancaster, O., LB $768,800, plumbing, heating and ventilating, High School (Newark, O.).

▲ The Pana House, Inc., 3716 W. 143 St., N. W., Cleveland, O. Owner Builds. $2,000,000, 200 HOMES, Madison Lake Estates, NORTH MADISON, O.

▲ Huber Homes, Inc., 6749 E. Main St., Columbus, O. Owner Builds. $2,000,000, 160 HOMES, on 50-acre site, Reynoldsburg Rose Hill Heights Dist. extending to Livingston Ave., REYNOLDSBURG, O.

▲ Gust K. Newberg Constr. Co., 2040 N. Ashland Ave., Chicago, Ill., CA $2,400,000, 130,000 sq. ft. rein.-con. 2nd and 3rd floor factory addn., CHICAGO, ILL. W. F. Hall Printing Co., 4600 W. Diversey Ave., Chicago, Ill. Edward P. Steinberg, 180 W. Washington St., Chicago, Ill., archt. Awarded Mar. 12.

▲ Sumner Sollit Co., 307 N. Michigan Ave., Chicago, Ill., LB $6,136,000, Proj. No. Ill. 234, Group 3, three 8 story and 4 story (bldgs.) 292 unit WASHINGTON PARK APARTMENTS, CHICAGO, ILL. Chicago Housing Authority, 608 S. Dearborn St., Chicago 5, Ill., Bids Mar. 17. CD 3/9.

Joseph J. Duffy Co., 4994 N. Elston Ave., Chicago, Ill., LB $2,527,690, Proj. No. Ill. 234, Group 2, 2 story and 4 story 128 unit WASHINGTON PARK APARTMENTS, (Chicago, Ill.).

S. N. Nielsen Co., 3059 W. Augusta Blvd., Chicago, Ill., LB $1,293,000, Proj. No. Ill. 234, Groups 1 and 2, 1 high rise and 4 story row on row bldgs. 84 unit WASHINGTON PARK APARTMENTS, 47th to 63rd Sts. (Chicago, Ill.).

▲ Miller-Davis Co., 1029 Portage St., Kalamazoo, Mich., CA $3,500,000, 39-store SHOPPING CENTER, GRAND RAPIDS, MICH. Rogers Plaza Shopping Center, c/o contractor. W. Thorsen, 124 South Fourth St., Minneapolis, Minn., archt.

WEST OF MISSISSIPPI

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

BRIDGES

April 3 North Dakota — April 9 Kansas

April 23 South Dakota

STREETS AND ROADS

April 2, 9 Kansas — April 13 North Dakota

April 23 South Dakota

▲† Minnesota and Illinois—HOUSING—BA 4:30—Base Procurement Office, 342rd Fighter Group (ADEF) U. S. Air Force, 510 Fidelity Bldg., Duluth, Minn., 18 family housing units at Grand Rapids Air Force Station, Minn.; 18 family housing units at Hanna City Air Force Station, Ill. IFB 21-603-59-86. Plans deposit $50.

BUILDINGS—BA

▲ Tex., Waco—DORMITORY—BA 4:7—Baylor University, 1401 S. 5th St., boys' dormitory, $1,725,000. Plans deposit $50. Easterwood, Easterwood & Drennon, 708 N. Valley Mills, archts. Geo. McDonald, 522 N. P. Anderson Bldg., Fort Worth, engr. CD 9/8.

▲ Minn., St. Cloud—DORMITORY—BA 4:24—State College Bd., 41 Sherburne Ave., St. Paul, Minn., Shoemaker Hall (dormitory) addn., $1,000,000. Plans deposit $50. F. Jackson & Assocs., 102 3d Ave. S., archts. CD 7/30/57.

HEAVY CONSTRUCTION—LB & CA

▲† Standard Industries, Inc., 731 Mayo Bldg., Tulsa, Okla., CA $2,030,604, depot maintenance apron, Tinker Air Force Base, ENG-34-066-59-42, OKLAHOMA CITY, OKLA. U. S. Eng., Box 61, Tulsa, Okla. Bids Mar. 11. CD 2/26.

BUILDINGS—LB & CA

▲ Lehr Constr. Co., 2115 Frederick Ave., St. Joseph, Mo., CA $3,193,912, 4 story, 204 bed irregular shape HOSPITAL, ST. JOSEPH, MO. St. Joseph's Hospital, St. Joseph, Mo. Bids Mar. 4. CD 3/17. under LB.

▲ C. Ralfo Contg. Co., Inc., 5000 Kemper Ave., St. Louis 9, Mo., LB $1,340,800 (3 bidders), general contract 2 and 3 story, brick, masonry block, steel, concrete HIGH SCHOOL, Redman Ave., east of Bellefontaine Rd., ST. LOUIS COUNTY (Zone 38), MO. St. Louis Archdiocese Bldg. Comm., 4396 Lindell Blvd., St. Louis 8, Mo. Bids Mar. 5. CD 2/19.

▲ Refinery Engineering Co., 108 N. Trenton, Tulsa, Okla., CA Est. $3,000,000, 7,000 bbl. delayed COKER PLANT, CORPUS CHRISTI, TEX. Coastal Products Co. (Sunray-Mid-Continent Oil Co. and Sunside Refining Co.) 907 S. Detroit St., Tulsa, Okla. CD 2/17.

▲ Tidmore Constr. Co., 2221-34th St., Lubbock, Tex., CA Est. $1,250,000, addn. SHOPPING CENTER UNITS. CA $90,000, asphalt paved shopping area and auto center. CA $59,118, site earthwork, LUBBOCK, TEX. Monterey Center, J. R. K. D. & A. M. Jr. Leftwich, 1311 Ave. H, Lubbock, Tex. Grand total $1,399,118. CD 3/17.

▲† Thomasons Enterprises, Inc., Midland, Tex., Owner Builds, $1,300,000, HOTEL, MIDLAND, TEX. Gvale & Assocs., 2525 W. 7st St., Los Angeles, Calif., and F. C. Olds & Co., 325 Hickory St., Abilene, Tex., assocs. archts. CD 3/18.

FAR WEST

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

BRIDGES

April 15 California

STREETS AND ROADS

April 15, 16 California

▲ Calif., Los Angeles—BA 4:8—Metropolitan Water Dist. of Southern California, 306 W. 3rd St., 3 reinf. con. pressure control structures and piping, cities of Brea, LaHabra, Downey, Spec. 566. $2,500,000.

▲ Calif., Sacramento—BA 4:9—Sacramento Municipal Utility Dist., Eng. Dpt., 59th and R Sts., Upper American River Proj., 150 ft. high, concrete arch junction Dam and Jaybird Tunnel Intake and other pertinent in El Dorado Co., Inv. No. 2207. Over $2,000,000. CD 1/8/58.

▲† California—BA 4/15—U. S. Eng., 751 S. Figueroa St., Los Angeles, levees and channel work, Santa Maria River, Santa Maria, ENG-04-353-59-31, $1,750,000. CD 9/23.

(Continued on page 92)

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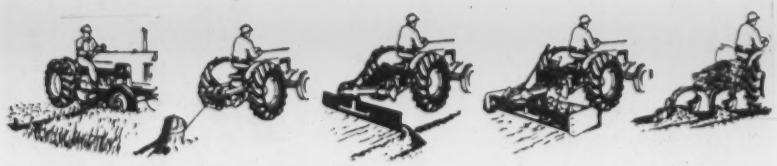

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(Continued from page 89)

▲ California—BA 4/22—State Dpt. Water Resources, 1120 N. St., Sacramento, 1st stage, Lower San Joaquin River Flood Control Proj., Merced Co., incl. work on 51 mi. new levees and enlargement 5 mi. existing levees; constr. 140 drainage and irrigation structures. $2,400,000. CD 9/20/55.

▲† Calif., Lemoore—ADMINISTRATION AREA FACILITIES, etc.—BA 4/22—Dist. Pub. Wks Office, 12th Naval Dist., Room C 112, San Bruno, administration area facilities, Naval Air Station, incl. personnel and admin. bldgs., etc., roads, utilities and sewage plant. Over $5,000,000; concrete aircraft parking aprons and taxiways. Over $1,000,000. U. S. Naval Air Station. CD 9/8.

▲ Calif., San Diego—BA 5/8—San Diego County Water Auth., 2750 4th Ave., 13.6 mi. 66 in. concrete aqueduct pipe from La Mesa and Lower Otay Reservoir. $7,000,000. CD 7/31/57.

BUILDINGS—BA

▲ Calif., Santa Ana—ENGINEERING—BA 4/22—Orange Co., Courthouse, 3 story, rein.-con. Engineering Bldg. No. 2. $1,500,000. CD 4/9/58.

HEAVY CONSTRUCTION—LB & CA

▲† Healy Tibbitts Constr. Co. & Granite Constr. Co., 411 Brannan St., San Francisco, Calif., CA $4,522,100, stone breakwaters (West Breakwater 2,600 ft. long, East Breakwater 4,400 ft. long, 200 ft. stone protection) Hal Moon Bay, vicinity of Princeton, San Mateo Co., ENG-04-203-59-53, CALIFORNIA. U. S. Eng., 180 New Montgomery St., San Francisco, Calif. Bids Feb. 10. CD 3/13, under LB.

▲ Steve P. Rados, Inc., 112 W. Maple Ave., Monrovia, Calif., CA $1,547,860, Miller-Holder Trunk Sewer, Huntington Beach, Contr. 3-2, SANTA ANA, CALIF. Orange County Sanitation Dist. No. 3, 1104 W. 8th St., Santa Ana, Calif. Bids Feb. 25, awarded Mar. 11. CD 3/2, under LB.

BUILDINGS—LB & CA

▲ Cawdrey & Vemo, Inc., 3601 Fremont Ave., Seattle 3, Wash., CA $1,644,869, 2 story, rein.-con., structural steel DEPARTMENT STORE, RENTON, WASH. R. L. Edwards, 12906 86th Ave. S., Renton, Wash. Sears, Roebuck & Co., lessee. CD 2/24, under LB.

▲ Utah Constr. Co., 100 Bush St., San Francisco, Calif., CA Est. $3,000,000, 9-level, bsmt., 108 x 274 ft., rein.-con. PARKING GARAGE, 3rd Ave. between Pine and Stewart Sts., SEATTLE, WASH. Sierra Corp., 100 Bush St., San Francisco, Calif. CD 10/31.

▲ Rothschild, Raffin & Weirick, 274 Brannan St., San Francisco, Calif., CA $2,393,300, 6 story, 122,000 sq. ft., rein.-con. EARTH SCIENCE BLDG., University of California Campus, BERKELEY, CALIF. Bd. Regents, University of California, Admin. Bldg., Berkeley, Calif. Bids Feb. 25. CD 3/2, under LB.

▲ Covina Union High School Dist., 165 W. Dexter St., Covina, Calif., cancelled bids to have been opened Mar. 24, Charter Oak HIGH SCHOOL addn., COVINA, CALIF. Est. $1,300,000. Will re-advertise. CD 2/26.

▲ Douglas W. Edwards, 2131 Ball Rd., Anaheim, Calif., CA $2,471,750, 197 DWELLINGS, Tract 2732, GARDEN GROVE, CALIF. Parkside Homes, Box 509, Santa Ana, Calif.

▲ Rom & Cola, Inc., 3700 Newport Blvd., Newport Beach, Calif., Owner Builds, $2,000,000, 9 story steel frame, rein.-con. APARTMENT, incl. 36 boat slips, NEWPORT BEACH, CALIF. Pleger, Blurock & Ellerbroek, 2515 E. Coast Hy., Corona del Mar, Calif., archts.

▲ B. L. Metcalf, 1460 N. Glassel Ave., Orange, Calif., CA $1,621,344, est. $1,500,000, 2 and part 3 story, rein.-con. HOSPITAL, PACOIMA, CALIF. Pacoima Memorial Lutheran Hospital, 13729 Van Nuys Blvd., Pacoima, Calif. Bids Feb. 27, awarded Mar. 13. CD 3/9, under LB.

CANADA

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

BRIDGES

April 9 New Brunswick

BUILDINGS—BA

▲ Ont., Windsor—HOSPITAL—BA 4/15—Hotel Dieu Hospital, 1030 Ouellette Ave., (selected list of bidders) 8 story, 80 x 250 ft., structural steel, brick block hospital addn. $4,000,000. Plans deposit $50. Pennington & Carter, 404 Morris Block, Windsor, archts. CD 4/25/58.

BUILDINGS—LB & CA

▲ Pigott Constr. Co. Ltd., 36 James St. S., Hamilton, Ont., CA Est. $6,500,000, 308 bed HOSPITAL addn., HAMILTON, ONT. Sisters of St. Joseph, St. Joseph's Hospital, Hamilton, Ont. Prack & Prack, 310 Main St. E., Hamilton, Ont., archts.

LATIN AMERICA

HEAVY CONSTRUCTION—LB & CA

▲ Compagnie Indstrielle de Traveaux, Paris, France, and Societa Imprese Italiane All'Estero, Milan, Italy, LB 650 kw. hydro-electric power plant at El Chocon Falls, Limay River, Patagonia Province, ARGENTINA. Government of Argentina, Buenos Aires, Argentina; British Insulated Callender's Constr. Co. and English Electric Co. Ltd., London, England, will supply equipment (Argentina); Techint and SAGEN, Buenos Aires, Argentina, LB 682 mi. 380 kv. transmission line (Argentina). Total cost $125,000,000.

(Proposal Advertisements see pp. 102 to 104)

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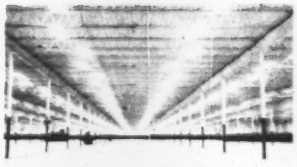

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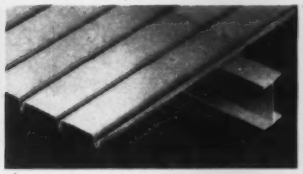

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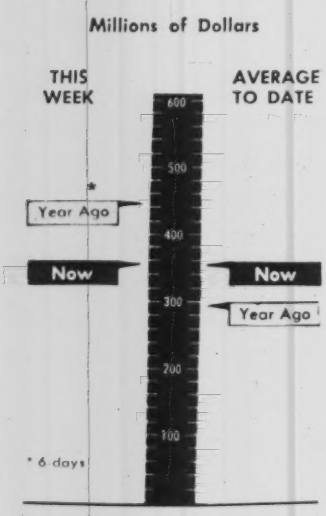
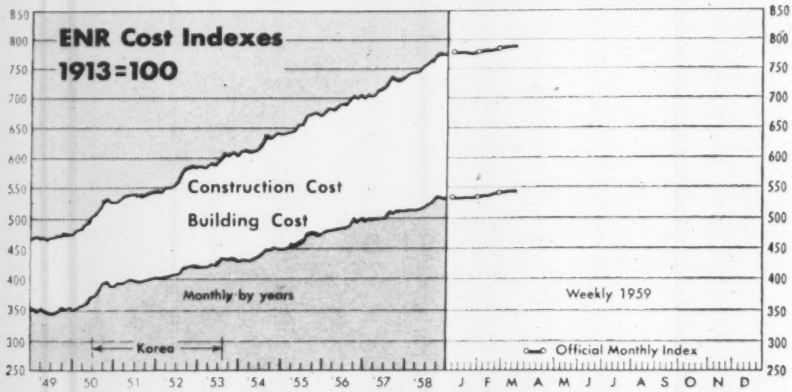
Construction Scoreboard

CONTRACTS ...





CURRENT COST INDEXES

ENR INDEXES (1913=100), 20-cities' average	Week of Mar. 19 1959	% Change from Feb. 19 1959	% Change from Mar. 20 1958
Construction Cost	783.50	+0.4	+5.3
Building Cost	542.47	+0.5	+5.2

To convert above indexes to 1926 = 100: Divide Construction Cost by 2.080; Building Cost by 1.850.
1949 = 100: Divide Construction Cost by 4.770; Building Cost by 3.518.

AMOUNT OF CONTRACTS LET

By Ownership	This Week millions	Cum. 13 wks 1959	Chge '58-'59 %
ALL Heavy Constr.	$355.4	$4,599.9	+20
PRIVATE	179.9	2,273.1	+30
PUBLIC	175.5	2,326.8	+12
State & Municipal	135.0	1,673.1	+1
Federal	40.5	653.7	+54
By Type of Work			
PUBLIC			
Waterworks	1.9	112.4	+95
Sewerage	11.1	140.7	−3
Bridges*	3.6	152.0	+50
Highways	35.6	620.9	....
Earthwork, Waterways	14.8	174.3	+5
Buildings, Excl. Housing	50.3	615.1	+8
Housing	4.1	136.0	−51
Unclassified	54.1	375.4	+163
PRIVATE			
Building			
Mass Housing	75.0	934.6	+19
Commercial	47.1	526.2	+12
Industrial	51.2	706.6	+32
Unclassified	6.6	105.7	−9

* Includes private bridges

NOTE: Minimum size projects included are: Waterworks and waterways, $53,000; other public works, $88,000; industrial buildings, $110,000; other buildings, $400,000.

. . . CAPITAL

New Capital For Construction	Week of Mar. 19 millions	Cum. 12 wks 1959	Chge '58-'59 %
Corporate Securities	$ 48.6	$ 773.5	−44
State and Municipal:			
All Except Housing	158.2	1,505.9	−13
Housing	....	27.8	+2217
Federal Loans	....	21.0	−56
Federal Aid	....	....	....
Total Nonfederal	$206.8	$2,328.2	−26
Federal Appropriations:			
Projects in U. S.	....	....	−100
Outside U. S.	....	....	....
Total New Capital	$206.8	$2,328.2	−37

BACKLOG OF PROPOSED HEAVY CONSTRUCTION

	February 1959 (millions)	Percent Change from last Month	Year
Total U. S. (ENR reported)	$114,698	+0.2	+1.9
By Ownership			
Private	49,564	+0.1	+4.1
State & Municipal	51,227	+0.5	+0.3
Federal	13,907	−0.4	−0.2
By Type of Work			
Waterworks	2,722	+1.1	+12.2
Sewerage	3,642	+0.8	+6.6
Bridges	3,362	+0.05	−0.2
Highways	13,179	+0.8	−0.9
Earthwork, Waterways	11,897	−0.1	−3.2
Public Buildings	20,675	+0.3	+2.0
Industrial Buildings	17,195	+0.7	+2.7
Commercial Buildings	22,177	−0.4	+5.7
Unclassified, Private	10,193*	+0.2	+3.2
Unclassified, Public	9,658	−0.2	−2.1

*Includes private bridges, $91 million.

FLOW OF NEW PROJECTS INTO THE BACKLOG

	1959 Feb. (millions)	1959 2-months (millions)	Percent Change from '58 Feb.	Year Cum.
Total U. S. (ENR reported)	$1,531	$3,132	+6.1	+13.6
By Ownership				
Private	825	1,624	+19.8	+10.3
State & Municipal	648	1,632	−7.1	+15.8
Federal	57	176	+1.3	+26.7
By Type of Work—				
Waterworks	64	122	+747.5	+362.1
Sewerage	60	137	+13.1	−6.3
Bridges	15	133	−60.7	+31.4
Highways	201	480	+164.4	+36.2
Earthwork, Waterways	12	63	−57.6	+65.6
Public Buildings	306	618	−17.5	+1.4
Industrial Buildings	353	524	+95.2	−7.2
Commercial: Mass Housing	218	438	+9.3	−1.2
Other Building	180	420	−36.9	−43.1
Unclassified, Private	73	240**	+230.6	+377.2
Unclassified, Public	47	254	−74.0	−7.2

**Includes private bridges, $7.5 million.

FLOW OF THE PROJECTS OUT OF BACKLOG INTO CONTRACTS

Total U. S. (ENR reported)	$615	$1,533	+4.0	+12.4
By Ownership—				
Private	268	569	+10.8	+14.7
State and Municipal	241	652	−10.2	−8.8
Federal	106	312	+30.5	+104.1

Equipment Makers See Record '59

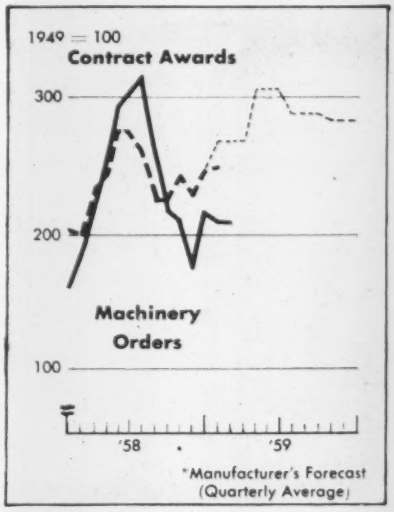
Construction equipment manufacturers are bubbling with optimism. They predict sales this year will top 1958 by 21% and set a new high in dollar value (see chart).

The forecast comes from manufacturers reporting their anticipated 1959 orders by quarters to the McGraw-Hill Economics Department. The reporting companies represent a sample of the industry, but those making the reports account for about half of total sales volume in the industry.

The estimates for individual quarters of 1959 are:

- 267, first quarter.
- 306, second quarter.
- 289, third quarter.
- 285, fourth quarter.

Now the forecast is for the Index of New Orders for Construction and Mining Machinery to average 286 for the full year, based on 1949 = 100. This compares with an index value of 237 in 1958 and a value of 249 in 1956 when a record was established.



The new forecast, based on expectations as of January, is more optimistic than the previous outlook as of October 1958. Then, manufacturers expected orders in the first nine months of 1959 to be 15% higher than in the same period of 1958.

The upturn in heavy construction contracts is largely responsible for increasing the rate and amount of construction equipment buying above manufacturers' forecasts made late last year. However, while the contract trend continues upward, the rise would have to carry much higher than expected by ENR if new machinery business is to equal the forecasts of the manufacturers.

Heavy construction awards in March are up sharply over the volume reported by ENR in January and February. Awards during the first three weeks of this month indicate the March Contract Award Index may exceed 260, based on 1949 = 100.

In January the New Orders Index for Construction and Mining Equipment rose to 248 (see chart). This is 23% above January 1958 and the third highest on record for a January.

Alaska Gets Small Construction Budget

Alaska has some distance to travel before it becomes a major source of state and municipal construction business. The legislature now holds the acting governor's recommendation for a balanced budget of $26.5 million. Less than $1 million of the total would go for construction, and most of that is for schools.

This $1 million of state construction money, however, will not be the only amount available for building. President Eisenhower has proposed that special federal grants of $27.5 million go to Alaska to help it through the transition period (ENR Feb. 12, p. 87). The funds would be paid over a five-year period, with at least $10.5 million available in the fiscal year starting July 1. Almost all of the total would go for construction, including road maintenance, airports and recreational areas.

Acting Gov. Hugh J. Wade told the lawmakers he recommended only those construction projects on which planning was so far advanced that postponement would result in financial loss.

Gov. Wade does want the state to be planning ahead, however. He asked for authority to form a planning commission to appraise state needs for buildings and other facilities. He wants to plan a long-term construction program. The commission would make its recommendations to the 1960 legislature. The governor said a building program would be financed "to the maximum extent through the sale of state bonds, rather than through current income."

The $26.5-million budget recommended is about $6 million above last year, when Alaska was a territory. But it is $6 million under the amount departmental heads requested.

The Democratic state administration makes apparent its announced policy of "hold the line." The budget asks $800,000 for school construction; the Education Department has requested $2 million. And a request by University of Alaska for $2.3 million in construction money was slashed to only $100,000.

The acting governor told the lawmakers that Alaska entered statehood in a "sound financial condition," but he warned against optimism. He said the change in status from territory to statehood and heavy reliance on federal funds "behooves us to proceed prudently. . . ."

Extent of this reliance is reflected by heavy construction contract awards as reported by ENR. During the first two months of this year, contract awards totaled $6.8 million. Of this, $6.2 million was for federal projects. The remainder represents private work.

Glass Prices Showing Signs of Softening

Window glass prices are down in Atlanta, Philadelphia and Montreal, but are up in Los Angeles. The price changes come after a month of steadiness in February.

Return of Pittsburgh Plate Glass to production following a prolonged strike may be a factor in the latest price reductions. The company was struck last fall, traditionally the time of year when warehouses stock up on glass. However, distributors in most areas apparently had no trouble obtaining glass they needed. During the October 1958-February 1959 strike period ENR sources reported window glass short only in Cincinnati.

This could mean that glass inventories are plentiful in most construction markets. Contractors may find the price tone softening as Pittsburgh Plate fills the pipelines in coming months.

(B&F continued on p. 96)

Construction Markets

Los Angeles: Code Changes Spur Construction

The skyline of downtown Los Angeles is growing up. **Two recent changes in the building code foreshadow a new profile for the city. Outdated earthquake design standards and a restriction that limited buildings to 13 stories have been rewritten to meet modern needs.**

The revised building code is spurring new growth in the heart of Los Angeles. In the few months since the changes, five privately financed buildings have been planned or started downtown. In addition, the city government is planning two multimillion-dollar development projects that will give Los Angeles a vast new civic center.

Before the building code changes, Los Angeles buildings were limited to a height of 150 ft, or 13 stories. (Only exceptions: the 26-story City Hall built in 1927 and the 17-story Federal Building completed in 1939.) The new ordinance allows a building to be constructed to 13 times the buildable area of the site.

An arbitrary rule-of-thumb had governed seismic design. Now an earthquake design formula has been established that takes into account rigidity and the period of vibration in specific building designs (ENR Mar. 19, p. 56). This change in seismic requirements gives a new orientation to design of Los Angeles structures. Here is the growth schedule for the new Los Angeles skyline:

• **In mid-1959 the Southern Counties Gas Co. expects to occupy its new $2,27-million building,** now under construction at 800 S. Flower St. The 13-story structure, located in an earthquake zone, will handle seismic stresses in a welded steel frame. The absence of shear walls will give the building a completely open ground floor for display. The welded frame will permit a story height of 11 ft. Albert C. Martin & Associates are the architects and engineers. General contractor is Lindgren & Swinerton, Inc.

• **In the autumn of 1959 construction should be completed on a $10-million, 20-story office building** at Wilshire Blvd. and Flower St., according to plans of the Tishman Realty & Construction Co. The facade will feature colored glass spandrels set off by vertical mullions of polished aluminum. This will emphasize the vertical lines of the building and offer a contrast to the large glass area. Design is by Victor Gruen & Associates, and Daniel, Mann, Johnson & Mendenhall.

• **In late 1959 or early 1960 construction will be completed on a $3-million addition to the Standard Federal Savings & Loan Association** at Wilshire and Grand St. The 13-story structure, with 125,000 sq ft of floor space, will have no shear walls. It will resist earthquake stresses with diagonal bracing. The existing building, a rigid curtain wall structure, will be connected to the new addition only by passageways. Architect is Welton Becket & Associates. Donald Douglas is engineer and general contractor on the job is C. L. Peck Construction & Realty Co.

• **In the spring of 1960 the highest private structure in the new Los Angeles skyline will be ready.** The 16-story Signal Oil & Gas Co. Building, under construction on relatively high ground, will overlook the Harbor Freeway from its site at Wilshire Blvd. and Beaudry St. The $5-million structure, 216 ft high, will contain three-level parking. C. L. Peck is the contractor. Pereira & Luckman are the architects and engineers. Structural engineers for the work are Brandow & Johnston.

• **In mid-1960 C. L. Peck Construction & Realty Co. expects completion of the 18-story California Bank Building** at 6th and Spring Sts. The building will be 267 ft high. Brandow & Johnston are engineers on the $13-million structure. Architect is Claud Beelman & Associates.

• **By 1970 the city expects to have a government and cultural center that will be a showplace of downtown Los Angeles.** One of the government projects is the $315-million Bunker Hill Redevelopment Plan on a central 91-acre site. The plan calls for demolition of about 390 buildings and dwellings, many dating back to the Gilded Age of the West Coast in the early 1900s. Detailed plans are drawn and federal urban redevelopment funds are pledged. If the City Council approves the final plans, construction could begin in about two years. The other big government project is a $370-million Civic Center. This will include 18 federal, county and city buildings covering a 228-acre site.

Hire Constructors, AEC Told

The General Accounting Office says that, in the future, the Atomic Energy Commission should contract directly with construction firms when undertaking a big reactor construction project.

AEC was criticized in a report by the Comptroller General to Congress for using Westinghouse Electric Corp. as prime contractor for construction of the 60,000 kw atomic power reactor at Shippingport, Pa. Subcontractors were Stone and Webster Engineering Corp., and Dravo Corp.

The nuclear power plant, first sizable one in the world devoted exclusively to production of electricity, was completed in December, 1957, at a cost of $119.3 million, almost a third higher than originally estimated.

The GAO says the increased costs were due, at least in part, to the "unusual and complicated" contractual arrangements for the project and weaknesses in the application of administrative controls.

The project was marked, says the Congressional watchdog agency, by low productivity of the labor force and late delivery of equipment and construction components.

The commission explained that AEC normally contracts directly for construction work. In this case, however, Westinghouse was selected because it had "unrivaled experience in pressurized water technology and was the only contractor that had any experience in administering the successful development and construction of a full-scale pressurized water plant."

Nevertheless, the GAO says, "We are recommending that, in future projects of this nature, AEC contract directly for construction service with construction firms, or firms experienced in administering major construction projects."

GAO has no authority to enforce its recommendations, and the executive branch often ignores them. Thus, its main power lies in sparking reaction in Congress.

However, since AEC says it does not plan generally to follow the Shippingport formula, Congress is expected to take little interest.

Business in Brief . . .

• **Airport aid clears House**—Federal aid to airports for the next four years will be compromised between a $297-million House bill and a $465-million Senate bill. Both measures extend 50-50 matching funds for four years from June 30. The House measure, passed last week, would provide $63 million yearly, plus $45 million in discretionary help in the last three years. The Senate would allow $100 million yearly, with $65 million extra for immediate use.

• **Machinery prices up**—Construction equipment prices rose only 0.2% during February, according to the U. S. Bureau of Labor Statistics. A 4.4% rise in the cost of concrete spreaders and finishers and slight boosts in a few other categories account for the upward move. Now, prices are expected to remain close to present levels until the fall.

• **Imports probe**—The U.S. Office of Civil and Defense Mobilization will investigate U.S. manufacturers' complaints that imports of large-size power generators threaten national security.

• **Builder contributions**—A Milwaukee suburb, Menomonee Falls, now requires homebuilders to contribute land or $200 a lot for each unit built in a subdivision. The contribution will go toward school construction or parks and recreation areas. Land donated would have to be equal to a value of $120 a lot for schools and $80 for park and recreation areas.

• **No hope now**—In the Senate hopper is a bill to provide a $2-billion, federally assisted, semi-public housing program for lower middle income groups. But it doesn't stand a chance of passage this session.

• **Lease-purchase schools**—New Mexico is considering legislation that would permit construction of schools by private corporations for lease to school districts.

• **Planning ahead**—Milwaukee's city and metropolitan sewage commissions approved a $55-million plan for sewers and a disposal plant. The plan would cover needs until the year 2000.

SAME SLING PRINCIPLE AS IN JET PILOT HELMETS

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Slings in Gentex Safety Hats use same design principle as slings in Gentex jet flight helmets. 6-pt. suspension, 3-layer crossover at crown. Rugged polyethylene shell exceeds all Federal Safety specifications, yet the Gentex weighs within ¾ ounce of any safety hat made. No metal parts — fully non-conductive.

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WHAT will America be like in 15 years?

Economists tell us there will be 60 million more people; that our total output of goods and services will almost double; that personal incomes will be 50% higher; that twice as many automobiles will be on the road; that the "2 home" family will not be uncommon; that some of us will travel into outer space; that we will own twice as many garments as today; that we will use 4 times as much electric power.

Economists also tell us this growth is not automatic. Attainment of our full potential depends on wise planning and aggressive, farsighted management of our economy.

America has grown faster in the past decade than it has ever grown before. Nevertheless, there is an increasing gap between its rate of growth and the pace at which we are adding the necessary facilities to assure continued growth. How wide can this gap become before inadequate, outdated and worn-out facilities cripple our growth?

OUR CITIES are becoming blighted far faster than our programs to remedy them. More than 30 million Americans change their residency each year—most of them to metropolitan areas. This problem is not new, it just keeps on increasing.

OUR PORTS AND HARBORS are antiquated, inefficient. Many of the piers still in use were inadequate even before the turn of the century, but through a patchwork of modifications and repairs have been kept in uneconomical service. The new St. Lawrence Seaway creates a big demand for expenditures for harbor facilities. Inland ports will mushroom and coast ports must improve to stay in business.

OUR HIGHWAYS are being increased through the largest single construction program in the history of the world. Yet, as huge as this road-building program is, it is already claimed that it will fall far short of our needs and must be augmented by additional programs.

OUR SCHOOLS, despite all recent construction, are still over-crowded. And the big boom is still to come. College applications are expected to double by 1970. High schools will require three times as much space and three times as many teachers.

OUR AIRPORTS are the bottlenecks of the jet age. Few commercial airfields are adequately equipped to handle jet airliners. Present plans demand the construction, by 1960, of new facilities for at least 70 airports to prepare them for jet traffic. Only 55% of the funds needed for jet age expansion and modernization are in sight for the 4 fiscal years July '58 through June '62.

OUR WATER SUPPLY facilities must be increased if they are to meet new and existing demands. Annual spending for these facilities has to be increased by 25%... to provide the same quality of service that exist[s] World War II. Per capita use of water has tripled since 1900 and i[s] to increase a third more to 2100 gallons per capita per day by 1975. try has not yet been able to make up for its hiatus of construction [in] 1945.

OUR SEWAGE TREATMENT facilities are inadequate f[or] the 96 million people served by municipal sewage systems. Th[e] Health Service has published figures showing that, although sew[age] and collection systems construction has been increasing since 19[45] of pollution material reaching the nation's watercourses has act[ually]

Have all these needs of the nation grown without the fe[w] local governments being aware of them? Of course not. Pr[ac]tically must of the current basic needs are already in the planning sta[ge]. *moving to the construction stage too slowly?* Although there is opinion on how the financing burden should be shared between governments, the fact remains that the needs are very pressi[ng] only adds to the final cost—no matter how financed.

The pity of it all is that there will never be a better tim[e] than right now. The capacity of the construction industry because of the spurt in industrial construction during the time high. But the growth of new construction has slowed It was just a few months ago that contract awards finally an 18 month recession. Thus, right now there is a great capacity in the construction industry.

The big increase in competition for new work, the e[x]ages, the abundance of modern construction machinery a[nd] of materials have resulted in lower bids being turned in struction is now going at bargain prices... but these low Because of higher productivity, contractors raised their 1950's than the rise in costs of basic building materials higher productivity will continue to hold down the ri[se] these prices are bound to move upward because of th[e] wages. Building costs today are not only cheaper than than they will be in the years just ahead.

This message is presented by Engineering News-Record, the of the construction industry. It is hoped that community-min the immediate attention of local, state and federal represent[a]tives message to the attention of local, state and federal represent[a]tives obtained by writing Engineering News-Record, McGraw-H[ill] 42nd Street, New York 36, N. Y.

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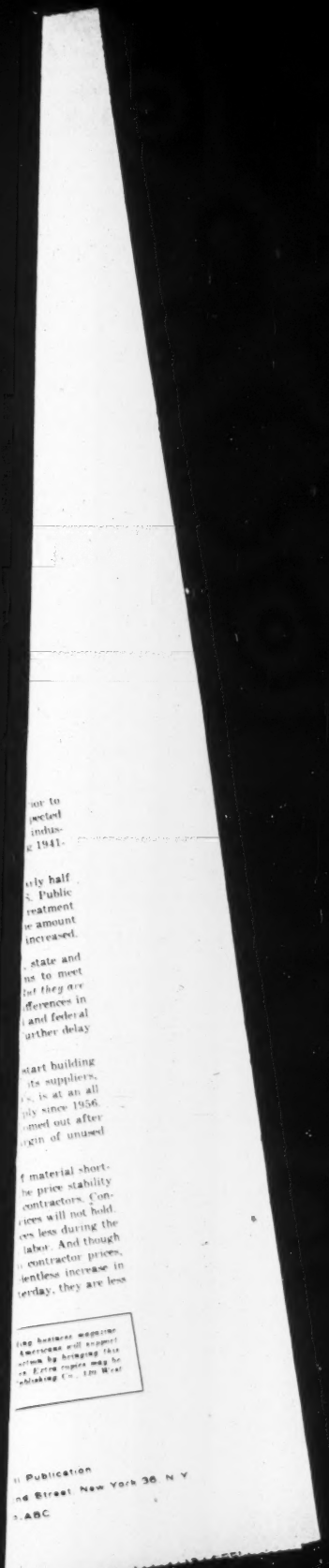

Several times during the past few years, our nation and its elected representatives have faced decisions which had a great bearing on the progress of our nation and the construction industry.

On each of these occasions, Engineering News-Record, as the leading business publication of the construction industry, saw fit to publish special messages directed to the American people and the individuals faced with the decisions. These messages appeared in major newspapers and were sponsored wholly by Engineering News-Record.

America is again at a crossroads that affects the future of the country and the construction industry. And again, Engineering News-Record is presenting a special message on the subject. This message appears in Business Week and the Wall Street Journal.

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Engineers Split on Union Issue

- **Half oppose collective bargaining; they stress the intangible rewards they have now and the flexibility that might be lost in a union.**
- **About 20% want to raise salaries through collective action. But trade union affiliation is generally ruled out.**

About 20% of the scientists and engineers on the payrolls of large business firms look with favor on some form of collective action to improve their salaries. But 50% are strongly opposed to collective bargaining in any form.

These preliminary findings were announced last week by the University of Michigan's Bureau of Industrial Relations. They are based on interviews with 250 scientists and engineers in 10 major firms.

The reason most often given for favoring collective bargaining was to get higher salaries.

"Let's face it. We're all after more money," said one engineer. Another commented: "Engineers have to get their salary levels up above those of construction workers."

Bulk of those opposed to collective bargaining said it is unnecessary and would offer no advantages.

The general conclusions reached by the Bureau of Industrial Relations are these:

- There are no significant differences between scientists and engineers in attitudes toward collective bargaining.
- There is quite a high relationship between how an individual feels about his salary and his views on unions.
- There is no significant relationship between performance ratings of an individual and his attitude toward collective bargaining.
- The attitude toward collective bargaining varies widely in different firms, based largely on satisfaction with salary and treatment by management.

• The pros—Those who want some form of collective action are torn between two approaches.

Most of them are thinking along professional union lines, according to the survey. No one talked about wanting to join a trade union, such as the AFL-CIO craft and industrial unions. And no one indicated a desire to have a professional union that is affiliated with a trade union.

A smaller group favored professional society action to improve income and professional status. Here the opinions ranged from action in the form of collective bargaining to action of this type:

- New machinery for learning how members feel about employment problems and for presenting that feeling to management.
- More vigor in advocating and policing professional standards.
- Better publicity to build professional prestige.

• The cons—Those opposed to collective action advanced all sorts of reasons. The principal ones are these:

- Unionism would offer no real advantages and might be detrimental.
- Salaries and promotions received through collective bargaining would not reflect individual responsibility, performance or qualifications.

Specifically mentioned were the possible stifling of initiative, the inability to evaluate creative work properly under collective bargaining, loss of the present flexibility and the fear of being lost in a mass movement.

University officials who conducted the survey, however, said that those who opposed unionism and collective bargaining did not base their objections on "principle." Almost a fifth of those surveyed indicated they would shift their opinions if "conditions justified the change."

John W. Riegel, director of the University's Bureau of Industrial Relations summed up the survey this way:

"Collective bargaining would enable professionals to exert pressure on their managers for pay increases and benefits, and draw attention to their dissatisfaction as employees. But professionals probably could not look to collective bargaining for most of the intangible rewards which are vital to them. Satisfaction of these intangible desires depends a good deal on the skill of managers."

Pre-Hire Passes Its First Test

The pre-hire labor contract proposal in the Kennedy-Ervin labor reform bill survived a crucial test last week. The Senate Labor Committee rejected the Administration's alternative proposal of construction industry certifications without prior representation elections.

For construction, this was the most significant development in the current hearings and debates that threaten to delay even final committee action on labor legislation until after Easter.

The vote on the pre-hire-certification without-election issue was nine to six. Both proposals are part of the Taft-Hartley amendments now tied to labor reform legislation (ENR Feb. 12, p.21).

The pre-hire proposal is backed by the unions but generally opposed by employers. It would allow unions and contractors to make labor contracts before the workers are actually hired. It would also authorize a seven-day, instead of a 30-day, union shop clause and establish the validity of exclusive but nondiscriminatory union referral systems using specified hiring criteria.

The Senate committee also rejected Administration proposals to tighten present bans on secondary boycotts.

Approved, however, was extension of the non-Communist affidavit requirement to some employers, which was an Administration proposal.

The committee had earlier rejected a Kennedy-Ervin proposal that would have narrowed the definition of "supervisor" and thus have extended the right to unionize to some who are now excluded. But the committee did adopt a Kennedy-Ervin provision that would speed up union representation election procedures by lifting the pre-hearing requirement.

New Demands for a Shorter Week

AFL-CIO seeks a 35-hour week under federal law, but even labor is doubtful about how fast it can move

The mounting problem of technological unemployment drew a sharp demand from the AFL-CIO industrial unions last week for shorter working hours without a reduction in pay.

"Industrial production now is almost back where it was before the recession," argues the Industrial Union Department in its house organ, "but joblessness is just as high as it was throughout the slump." Result: "Higher productivity has come to have a bitter taste" and the nation now must choose between "shorter hours or continuing unemployment."

As part of the solution, the AFL-CIO is asking for a Congressional amendment of the Fair Labor Standards Act to reduce the 40-hour week to 35 hours in the form of five seven-hour days.

(Sen. John F. Kennedy [D., Mass.], a supporter of many labor goals, this week questioned a shorter workweek as an "effective device for dealing with unemployment in this country." He also warned that it might adversely affect our "production war" with Russia.)

If it succeeds, some of the construction industry will be affected; some will not. Local unions in some areas already have a seven-hour day.

But prospects for immediate action on a national scale are dim—even to the unions. AFL-CIO President Meany has indicated, and apparently for this reason, that unions will meanwhile continue to seek shorter hours at the bargaining table.

The drive, led in part by the carpenters union, will serve to focus national attention on a growing problem—and it may generate the climate of opinion essential to a change.

• **Some reservations**—Mr. Meany admits that "an educational job has to be done on the American people."

The United Brotherhood of Carpenters, which has come out for a four-day week, has its reservations about how fast it can be achieved. "A shorter workweek is possible," it says, "if not today or tomorrow, then next year or the year after that."

And teamster President James Hoffa thinks the move is premature. He is afraid too many workers will try to hold two jobs until one job pays more.

• **Stumbling blocks**—The carpenters union, which has historically been in the forefront of every move for shorter hours, feels the thinking on the implications of a shorter workweek must be refined before any drastic changes in the workweek occur.

Three things bother the carpenters—labor costs, moonlighting, and jurisdiction.

"A cut in hours is a gain only if there is no corresponding cut in wages," it observes. But then it asks: "How much of a boost in labor costs can the construction industry stand?" Wage scales of $4 to $5 an hour, it notes, are "meaningless unless there are jobs to pay the scale."

The union thinks construction is as susceptible to the law of supply and demand as "macaroni" is and that construction unions will be compelled "to balance hour reductions against demands for construction."

The logical approach to systematic achievement of the shorter workweek, it concludes, is for workers to take their "fair share" of increased productivity "in the form of shorter hours rather than higher pay."

(The AFL-CIO position is not so clear. The federation is committed to a continuation of "substantial" hourly wage increases to boost consumer purchasing power. It has never been satisfied with a status quo in real wages. The extent to which the federation's position will be tempered, if any, by the drive for a shorter workweek remains to be seen.)

• **Moonlighting**—The question of second jobs is closely related to this problem, as Mr. Hoffa indicated.

The carpenters say many of their members are already holding two jobs, although some of them are on a 40-hour week. "If men are shortsighted enough to seek supplementary employment whenever their hours are cut," the union argues, "then the whole intent of the shorter workweek is lost, and employment is not spread to any substantial extent."

It suggests that machinery should be developed to "police" moonlighting activities engaged in by union members before a "shorter workday is put into effect."

• **Jurisdiction**—A drastic cut in the workweek—say to four days—would also create a jurisdictional problem, the carpenters warn.

One trade in the construction industry, they say, "can hardly go it alone." (This kind of argument underscores the AFL-CIO strategy of effecting the change through federal law.)

The union points out that if some trades work five days and others only four, the four-day trades may find some of their work "gobbled up" by other trades in their absence.

• **The fear**—The AFL-CIO unions, however, seem to agree on the need for a shorter workweek, whether it be a seven-hour day or a four-day week.

"While one building tradesman is out of a job or working part time," the carpenters say, "the workweek is too long."

Like the AFL-CIO, the carpenters fear that automation, technological improvements and productivity gains will create a permanent corps of unemployed unless available work is spread around through a shorter workweek.

It calls the leisure time that would result socially desirable and economically necessary because of the "many vast industries" that depend on "leisure time" spending. No one, however, has yet suggested how to sell "leisure" to money-minded workers.

Only time will tell how fast or in what form the shorter workweek drive will be translated into action. All we now know is that labor has officially sounded the call for a nationwide, 35-hour week and that some international and local unions will individually continue to seek something less than a 40 or even a 35-hour week.

Construction Wage Rates Rise to $2.84 in South

Union construction workers in the South now have an average hourly wage scale of $2.84, according to the U.S. Labor Department's Bureau of Labor Statistics.

The new scale, which is 54 cents below the national average of $3.38, is the result of 1958 wage increases that averaged 12½ cents an hour.

Highest wage scale in the 28 cities covered by BLS is for bricklayers in Oklahoma City, $4.00 an hour. Building laborers in Montgomery, Ala., have the lowest, $1.20.

(*Labor continued on p. 102*)

Training: A Doomed Crusade?

In the midst of a general slump in apprentice training, the United Association of Plumbers and Pipefitters and the National Constructors Association have awarded $269,150 to 29 local unions for training.

The awards were announced last week by James P. Schoemann, administrator of the International Training Fund.

The fund was established in 1956 under a national labor agreement between the union and NCA members. These employers are now contributing to the fund 2½ cents an hour for each hour worked by U. A. journeymen and apprentices on their payrolls. Previously $54,200 had been awarded.

Local unions that received the awards will use the money to purchase modern welding and other mechanical equipment, textbooks and higher instructors' salaries in union and vocational schools.

The educational training program of the U. A. is one of the largest and most elaborate of any trade union in the nation. But the union is barely holding its own in the number of apprentices enrolled. At the end of last year it had 22,106—a drop of 876 from the year before.

This drop off is symptomatic of the general apprenticeship problem. The total number of registered apprentices in the construction industry has fallen steadily over the last three years. It is now 105,523. Three years ago, there were 112,619 registered apprentices.

The apprenticeship slump is taking place despite three generally accepted views:

- The industry is not training enough new men to meet its future needs.
- It is not giving those who are now journeymen enough training in the use of new materials and techniques.
- Industry training programs are an effective way to increase labor efficiency and to reduce construction costs.

In an effort to overcome some of this general apathy, labor and management groups and state and federal apprenticeship agencies have scheduled for this year a larger number of regional and state apprenticeship conferences than ever before.

Five regional and four statewide conferences will be held. All are designed to stimulate interest in apprentice and journeymen training and to afford an opportunity for constructive exchange of ideas on problems of mutual concern.

New Legal Support for Lockouts

The right of construction industry employers to engage in shutdowns or lockouts during collective bargaining negotiations may be put on a firmer legal footing now that a National Labor Relations Board regional director has refused to issue an unfair labor practice complaint against Cleveland employers who engaged in a 1958 shutdown.

The Building Trades Employers' Association in Cleveland hails the decision as one of "great importance" in management's fight against the whip-sawing tactics of unions and feels that a reversal of the decision is "unlikely."

The shutdown idled 35,000 construction workers for seven weeks. It was called by the BTEA and the Cleveland Chapter of Associated General Contractors after the asbestos workers union struck one of the BTEA employer-association members in April. The strike occurred after joint bargaining negotiations between the BTEA and 17 unions had begun.

Before the negotiations, BTEA and AGC had agreed that a strike by one union against any BTEA member would be treated as a strike against all. The agreement was admittedly a defensive measure against possible whip-sawing, in which a union plays one employer off against another in wage settlements.

Two non-striking unions later filed unfair labor practice charges against the BTEA and several members on the grounds of refusal to bargain and discrimination against the unions. They said their members were not on strike and were ready to work at all times. They asked for back pay.

Relying on the leading U. S. Supreme Court case on multi-employer bargaining (the Buffalo Linen Supply Co. case), the regional director said holding the lockout illegal "would not effectuate the policies" of the law. The unions have appealed to the NLRB General Counsel.

Although the Buffalo Linen case supports the proposition that employers may join together to bargain collectively and to take concerted action, such as a lockout, the right to do so is not spelled out in the law. The Supreme Court took the view that labor's right to strike is not so "absolute" as to deny employers the right to engage in "self-help."

Canadian Workers Get Two-Year, 24-Cent Raise

Four major British Columbia construction unions have signed two-year labor contracts calling for a total wage increase of 24 cents an hour. But a similar proposal has been rejected by the province's 10,000-member carpenters union.

The new agreements, which became effective the first of the month, were negotiated by the Heavy Construction Association and the General Contractors Association with locals of the operating engineers, tunnel and rock workers, teamsters and laborers.

Workers will receive a 12-cent wage increase this year and 12 cents more next March 1.

The 1959 rate ranges under the new agreements are: $2.32-$3.49 for tunnel and rock workers; $2.16-$3.24 for operating engineers; $2.25-$2.86 for teamsters; and $1.86-$2.58 for laborers.

Meanwhile, the bricklayers have settled with the General Contractors Association on a similar basis—a two-year pact with two 12-cent wage boosts. Effective April 1, the contract makes the hourly scale $2.87.

Statewide Bargaining Is Roadbuilders' Goal

A newly created labor relations division of the Wisconsin Road Builders' Association will attempt statewide labor contract negotiations, reports the association's executive secretary, E. E. Hoebel.

The effort to achieve uniform wages and working conditions on a statewide basis is the result of a feeling on the part of some association members that uniform contracts for firms bidding on roadbuilding projects would lead to a fairer competitive situation.

Contract negotiations in the past have been handled by individual roadbuilding firms. Future negotiations, under the new plan, will be conducted by the executive committee of the new labor relations division and representatives of the teamsters, operating engineers, carpenters and laborers unions.

The new division was formed last December.

Labor contracts negotiated by the division's executive committee will apply to highway, bridge and airport construction. They will be binding only on association members that join the division. Others are free to make any labor agreements they wish.

Mr. Hoebel estimated last week that half of the association's 300 members would be participating in the new program by the end of this year.

OFFICIAL PROPOSALS

RATE: The rate for Official Proposal advertising is $2.40 per line or fraction set solid. Where the advertisement is set other than solid, the space is measured by total space occupied and charged on basis of 12 lines to the inch.

CLOSING DATE: Friday 10:30 A.M. for issue dated the following Thursday.

SEND COPY TO: Official Proposal Division, Engineering News-Record Class. Adv. Div., P. O. Box 12, N. Y. 36, N. Y.

Bids: April 2, 1959.

New York State Road Work

NOTICE TO CONTRACTORS: STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of the Highway Law, Public Buildings Law, and special provisions for projects financed with Federal Aid Funds, sealed proposals will be received until ten-thirty o'clock A. M., eastern standard time on the 2nd day of April 1959, by Henry A. Cohen, Director, Bureau of Contracts, 12th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., for the following projects:

County	Contract No.	Name	Miles	Type	Deposit	Estimated Cost of Work
DISTRICT No. 5, E. G. H. Youngmann, District Engineer, State Office Bldg., 65 Court Street, Buffalo 2, New York						
Erie	FASCE 59-1	Scajaquada Creek Expressway Sect. I (Niagara Thruway to Grant St. Interchange) Proj. I-1087(4)	1.90 (0.91 Acc.)	Viaduct Structure = 1.26 Miles 9" Cem. Conc. Pavt. Var. Wide = 0.41 Miles Asph. Conc. Pavt. = 0.26 Miles Misc. Work = 0.88 Miles	$357,000 Plans $10	$6,502,000
Erie (Int. Tour. Rte. 90N	FINTC 59-1 NTC 59-2	Interstate Route 506 New York State Thruway Niagara Section Sub. N2 to N7 (Buffalo East City Line to South Grand Island Bridge) Proj. I-865(19)	14.50	Furnish & Install Electric Lighting Supply Points Equip.	$9,000 Plans $5	162,000
DISTRICT No. 6, James H. Thomas, District Engineer, State Office Bldg., 30 West Main Street, Hornell, New York						
Allegany	FASS 59-7	Belvidere-Angelica, Co. Rd. No. 20 Proj. S-529(1)	0.48	Bit. Mac. with Double Surf. Treat. Pavt. Comp. Beam Br. 3 Span 275'	$20,000 Plans $5	361,000
Schuyler (Rte. 14)	FARC 59-22	Watkins-Montour Falls, S.H. 5047 Proj. F-505(10)	1.33	Asphalt Concrete Pavement	$10,000 Plans $5	186,000
Steuben (Rte. 21)	FARC 59-21	Hornell-Wayland, Part 5, S.H. 8257 Proj. F-375(8)	2.63	Asph. Conc. Pavt. = 2.62 Miles Misc. Work = 0.01 Miles	$16,000 Plans $5	293,000
Steuben	FASS 59-9	Morgan Bridge, Co. Rd. No. 11 Proj. S-949(2)	0.81	Bit. Mac. with Double Surf. Treat. Pavt. Prestress Conc. Br. 4 Span 244'	$20,000 Plans $5	377,000
DISTRICT No. 7, Robert W. Sweet, District Engineer, 144 Van Duzee Street, Watertown, New York						
Franklin & St. Lawrence (Rte. 37)	RC 59-23	Massena-Helena, Pt. 1 & Pt. 2, S.H. 1261 and S.H. 1265 Raquette River-Hogansburg, Pt. 1 and Pt. 2, S.H. 1861 and S.H. 8396	4.58	Asphalt Concrete Pavement	$9,000 Plans $5	150,000
DISTRICT No. 9, Joseph C. Frederick, District Engineer, 71 Frederick Street, Binghamton, New York						
Otsego	FASS 59-8	Unadilla-Copes Corners, Co. Rd. No. 3 Proj. S-481(1)	0.30	Bit. Mac. with Double Surf. Treat. Pavt. Deck Girder Br. 1 Span 124'	$11,000 Plans $5	211,000
DISTRICT No. 10, M. E. Gould, District Engineer, 325 W. Main Street, Babylon, L. I., New York						
Queens (Int. Tour. Rte. 495)	FICE 59-2	Interstate Route Conn. 513 Clearview Expressway (33th Ave. to Willets Point Blvd.) Cont. No. 3 Proj. I-1112(11)	1.82 (2.82 Acc.)	9" Cem. Conc. Pavt. 2 @ 36' Var. Wide = 1.57 Miles (Access = 1.63 Miles Asph. Conc. and 1.19 Cem. Conc.) 3 Hy. Sups. W. F. Comp. Beam 2 Spans Each 114.3', 126.5' and 121' 1 Ped. Overpass W. F. Beam 4 Span 212.5' Misc. Work = 0.25 Miles	$420,000 Plans $10	7,678,000
Suffolk	HSP 59-1	Heckscher State Parkway (Sunrise Highway to Heckscher State Park) Cont. 1	6.27 (4.43 Acc.)	8" Cem. Conc. Pavt. with Carbon Black 2 @ 25' Var. Wide = 3.25 Miles 8" Cem. Conc. Pavt. Var. Wide = 2.64 Miles Asph. Conc. Pavt. = 4.73 Miles Misc. Work = 0.08 Mi. 4 Hy. Sups. Reinf. Conc. Rig. Frames 65.2', 66.5', 103.8' and 123.8' 1 Hy. Sup. Comp. Girder, 4 Span 215.2 RR Sup. Comp. Girder, 2 Span 167.8	$458,000 Plans $10	8,327,000

Any projects in this letting that are on the Federal Aid highway systems are subject to the provisions of the "Federal-Aid Highway Act of 1956", being Public Law 627, 84th Congress, approved June 29, 1956, and are also subject to the applicable New York State statutes.

In compliance with the provisions of Section 115 (Prevailing Rate of Wage), Public Law 627, the minimum wages to be paid laborers and mechanics are included in wage schedules that are set out in the bid proposal. Maps, plans, specifications and proposal forms may be seen and obtained at the office of the State Department of Public Works, Bureau of Contracts, Albany, N. Y., and at the office of the District Engineers noted above, and may also be seen at the office of the State Department of Public Works, 270 Broadway, New York City.

The deposit for Plans and Proposal Forms for each contract is indicated above. A refund will be made in full to bidders for return of one set, in good condition, within 30 days of award, or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

Special attention of bidders is called to "Information for Bidders" in the Public Works Specifications, and to the special provisions applying to projects financed with federal funds. Award of a contract is subject to priorities and allocations under the Defense Production Act of 1950, as Amended, and all regulations issued thereunder.

Proposal for each contract must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum as specified in the advertisement and the proposal. The retention and disposal of the bidding check, the execution of the contract and bond shall conform to the provisions of the Highway Laws, as set forth in "Information for Bidders".

The right is reserved to reject any or all bids.

J. BURCH McMORRAN
SUPT. OF PUBLIC WORKS

Bids: March 31, 1959

Triborough Bridge and Tunnel Authority

SEALED BIDS WILL BE RECEIVED BY Triborough Bridge and Tunnel Authority at its office, Administration Building, Randall's Island, Manhattan, New York 35, N. Y., as follows:

Until 11 A.M. on Tuesday, March 31, 1959

For Throgs Neck Bridge Contract No. TN-12C, Bronx Plaza Roadway and Cinder Storage Structure, Borough of the Bronx. The bid must be accompanied by a deposit in the amount of $80,000.00.

Plans, specifications and contract documents may be purchased at the office of the Authority for $40.00 which will not be refunded.

Bids: April 21, 1959

Contract GWB-190.034

THE PORT OF NEW YORK AUTHORITY
GEORGE WASHINGTON BRIDGE
SALT HOPPER

Sealed proposals for the construction of a concrete salt hopper on Hudson Terrace, Fort Lee, New Jersey, for the George Washington Bridge will be received at the office of the Chief Engineer of The Port of New York Authority, Room 1100, 111 Eighth Avenue, New York 11, N. Y., until 2:30 P.M. on Tuesday, April 21, 1959, at which time said proposals will be opened and read in Room 1108.

Contract documents may be seen at the office of the Assistant Chief Engineer for Design of the Authority, Room 1115. Documents will be furnished upon deposit of $30.00 per set for not more than three sets to any one company (each set including one copy of the contract drawings). Additional sets will be furnished upon payment of $30.00 per set, which payment is not returnable. Deposits and payments shall be delivered to the Treasury Department, Room 1001, where a receipt will be issued. The receipt shall be delivered to Room 1115, where the documents will be furnished.

Those who have submitted a bid on the contract directly to the Authority will receive a refund of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals. Those who have not submitted a bid will receive a refund of one-half of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals.

THE PORT OF NEW YORK AUTHORITY
Donald V. Lowe, Chairman

New York, March 26, 1959

OFFICIAL PROPOSALS

Bids: April 14, 1959

Advertisement for Construction Bids for the Livonia Drain No. 1 in the City of Livonia, Wayne County, Michigan

1. RECEIPT OF BIDS

The Drainage Board for Livonia Drain No. 1 will receive sealed bids until 11:00 A.M., Eastern Standard Time, Tuesday, April 14, 1959, at the Board of Wayne County Auditor's Board Room, No. 1222, City-County Building, Detroit, Michigan, at which time and place all bids will be publicly opened and read.

2. DESCRIPTION OF WORK

The principal quantities of work are as follows:

Section No. 1—165 lin. ft. Triple box; 7898 lin. ft. 12'-6" x 12'-6" box; 499 lin. ft. 36" sewer; 578 lin. ft. 30" sewer; 43 lin. ft. 24" C.M.P.; 1612 lin. ft. 15" sewer; 25 manholes; junction chambers; inlet structure, and 2200 lin. ft. 12" water main.

Section No. 2—2732 lin. ft. 8'-6"; 2729 lin. ft. 8'-0"; 6616 lin. ft. 7'-0"; 1397 lin. ft. 54"; 893 lin. ft. 36"; 310 lin. ft. 24" open cut sewers; 37 manholes; special sewer crossing and overflow chambers.

Section No. 3—2522 lin. ft. 12'-0"; 2662 lin. ft. 10'-6"; 2553 lin. ft. 10'-0"; 6553 lin. ft. 7'-6"; 988 lin. ft. 7'-0"; 1650 lin. ft. 6'-6"; 933 lin. ft. 48"; 327 lin. ft. 42"; 286 lin. ft. 36"; 641 lin. ft. 30"; 147 lin. ft. 24"; 82 lin. ft. 21" open cut sewers; 54 lin. ft. 54"; 277 lin. ft. 48" tunnel sewers; 31 manholes; junction chambers, overflow chambers; inlet structures; special sewer and water main crossings and 1025 lin. ft. 12" water main.

Section No. 4—2730 lin. ft. 10'-6"; 3105 lin. ft. 10'-0"; 1211 lin. ft. 7'-6"; 2200 lin. ft. 7'-0"; 378 lin. ft. 48"; 396 lin. ft. 42"; 688 lin. ft. 27"; 42 lin. ft. 24"; 216 lin. ft. 21" open cut sewer; 147 lin. ft. 48" tunnel sewer; 29 manholes; siphon; junction chamber; special sewer crossings; water main crossing inlet and 190 lin. ft. 12" water main.

3. PLANS AND SPECIFICATIONS

Plans and specifications are on file and copies may be secured at the office of the Wayne County Drain Commissioner, 3523 Cadillac Tower, Detroit 26, Michigan. A deposit of Twenty-Five Dollars ($25.00), *Check only*, will be required on each set of plans, which will be refunded upon their return in good order within ten (10) days after the opening of bids.

4. BID BOND

A certified check or bank draft payable to the Drainage Board Livonia Drain #1, or a satisfactory bid bond executed by the bidder and a surety company, in an amount equal to Five Per Cent (5%) of the bid, shall be submitted with each bid. No bid may be withdrawn for at least One Hundred Fifty (150) days after the scheduled closing time for receiving bids.

5. AWARD OF CONTRACT

The Drainage Board reserves the right to reject any or all bids, to award the work by sections, and to waive any irregularities in bidding. The successful bidder will be required to furnish satisfactory performance, labor and material bonds and insurance certificates.

HENRY V. HERRICK
Wayne County Drain Commissioner
Chairman Drainage Board
Livonia Drain No. 1

Bids: April 3, 1959

Govt. of District of Columbia, Dept. of Highways & Traffic, D. C.

March 6, 1959. SEALED PROPOSALS will be received in Room 404, 499 Pennsylvania Ave., N.W., Washington 1, D. C., until 2 P.M., EST, April 3, 1959, and then publicly opened and read for Grading and Drainage of a Section of the proposed Anacostia Freeway, from Chesapeake Street, to D.C. Line, Fed. Aid Proj. Interstate I-295-2(18)0, consisting of approx. 82,300 sq. yds. Stabilized Soils Base Course 10" in compacted depth and 8,500 sq. yds. Stabilized Soils Base Course 12" in compacted depth. Minimum wage rates for this project have been predetermined as required by law and are set forth in the bid proposal. Proposal forms, plans and specifications obtainable from Supervisor, Bid & Contract Section, Procurement Office, D.C., Rm. 404, 499 Pennsylvania Ave., N.W., upon deposit of a certified check for $30.00 per set, payable to D.C. Treasurer. (Phone NA 8-6000, Ext. 2378).

OFFICIAL PROPOSALS

Bids: April 21, 1959

Contract GWB-190.027

THE PORT OF NEW YORK AUTHORITY
GEORGE WASHINGTON BRIDGE
NEW ADMINISTRATION BUILDING
STRUCTURAL STEEL

Sealed proposals for the furnishing and erection of structural steel for the new administration building and adjacent viaduct for the George Washington Bridge in Fort Lee, New Jersey, will be received at the office of the Chief Engineer of The Port of New York Authority, Room 1100, 111 Eighth Avenue, New York 11, N. Y., until 2:30 P.M. on Tuesday, April 21, 1959, at which time said proposals will be opened and read in Room 1108.

Contract documents may be seen at the Office of the Assistant Chief Engineer for Design of the Authority, Room 1115. Documents will be furnished upon deposit of $30.00 per set for not more than three sets to any one company. Each set including one copy of the contract drawings. Additional sets will be furnished upon payment of $20.00 per set, which payment is not returnable. Deposits and payments shall be delivered to the Treasury Department, Room 1001, where a receipt will be issued. The receipt shall be delivered to Room 1115, where the documents will be furnished.

Those who have submitted a bid on the contract directly to the Authority will receive a refund of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals. Those who have not submitted a bid will receive a refund of one-half of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals.

THE PORT OF NEW YORK AUTHORITY
Donald V. Lowe, Chairman

New York, March 26, 1959

Bids: April 21, 1959

Contract GWB-190.023

THE PORT OF NEW YORK AUTHORITY
GEORGE WASHINGTON BRIDGE
LOWER LEVEL EXPANSION
NEW JERSEY APPROACH
PHASE 2

Sealed proposals for the construction of the New South Marginal Street between Center Avenue and Lemoine Avenue in the Borough of Fort Lee, New Jersey, together with the utilities thereto or all in connection with the Lower Level Expansion of the George Washington Bridge will be received at the office of the Chief Engineer of The Port of New York Authority, Room 1100, 111 Eighth Avenue, New York 11, N. Y., until 2:30 P.M. on Tuesday, April 21, 1959, at which time said proposals will be opened and read in Room 1108.

Contract documents may be seen at the office of the Assistant Chief Engineer for Design of the Authority, Room 1115. Documents will be furnished upon deposit of $30.00 per set for not more than three sets to any one company. Each set including one copy of the contract drawings. Additional sets will be furnished upon payment of $20.00 per set, which payment is not returnable. Deposits and payments shall be delivered to the Treasury Department, Room 1001, where a receipt will be issued. The receipt shall be delivered to Room 1115, where the documents will be furnished.

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THE PORT OF NEW YORK AUTHORITY
Donald V. Lowe, Chairman

New York, March 26, 1959

Contractors Watch This Section—

for new projects. Publish your announcements through the proposal sections of *Engineering News-Record* and get their bids.

EMPLOYMENT OPPORTUNITIES

Send NEW Ads and Inquiries to Classified Advertising Division of ENGINEERING NEWS-RECORD, P. O. Box 12, N. Y. 36.

ADDRESS BOX NO. REPLIES TO: Box No. Classified Adv. Div. of this publication. Send to office nearest you.
NEW YORK 36: P. O. BOX 12
CHICAGO 11: 520 N. Michigan Ave.
SAN FRANCISCO 4: 68 Post St.

• *POSITIONS VACANT*

Associate and Assistant Professors for fields of advanced dynamics, advanced strength, and elasticity. Also have opening for graduate student as half-time instructor. Engineering Mechanics Dept., Kansas University, Lawrence, Kansas.

City Engineer—registered engineer with qualifying experience in supervision of sewage treatment plant, storm & sanitary sewers, street and sidewalk design and building code. Salary open as to qualifications. City Clerk, City Hall, Algona, Iowa.

Rock Tunnel Superintendent, for 5400 l.f. project Central New York. Will consider only first class man with broad, extensive background. Start immediately. P-1158, Engineering News-Record.

Civil engineer, graduate, with strong background in design, plant control, placement bituminous concrete mixes, $8500-10,000 range. Give full information. P-1161, Engineering News-Record.

Draftsman-Estimator for growing Prestressed Concrete manufacturer on Central-South coast. Similar experience desirable but not essential. Architectural background with field experience desired. Good opportunity for man with initiative. Send resume to P-1168, Engineering News-Record.

Assistant Chief Materials Testing Laboratory. To assist in planning and supervising the work of the chemical and physical testing units of the City of Philadelphia's materials testing lab. We require college graduation with major course work in engineering or physics and 4 years of experience in the physical and chemical testing of materials, including 2 years in a supervisory capacity. Equivalent combinations of exp. & educ. will be considered. Salary starts at $7265 per yr., regular increases, liberal fringe benefits. Send resume to Miss Alma Goldman, Room 975 City Hall, Phila. 7, Penna.

Assistant Engineer. Min. 3-5 yrs municipal experience. Location—Northern N. J. P-1216, Engineering News-Record.

Wanted—Construction Superintendents: Long established midwest construction firm has opening for two or more qualified field construction superintendents. Engineering background preferred but not required. Applicants must be aggressive, cost-conscious and well grounded in reinforced concrete, structural steel and masonry structures. Complete education, experience data and salary expected should be furnished in first reply. P-1107, Engineering News-Record.

Superintendent—Water And Sewers. Graduate sanitary engineer wanted with minimum 3 years experience in an administrative capacity of water filtration plant and water system operations and/or sewage disposal systems. Salary range $6,108 to $7,356. Eligibility for Professional Engineers license preferred but not required. Send resume and application to City Administrator, City Hall, Batavia, New York.

Construction Superintendent—With engineering background for directing field operations in connection with heavy industrial projects, preferably previous experience in cement plant expansion and chemical plants. Location Middle West. Opportunity for someone desiring long range employment and advancement. State full qualifications. P-1291, Engineering News-Record.

Clerk of Works—In charge of field office with experience in heavy industrial construction. Past experience in similar employment necessary. Must be capable to direct payrolls, cost keeping, material and equipment receipts. Give complete details. P-1296, Engineering News-Record.

Construction Super. Schools, Hospitals, etc. Cost conscious; give experience, age data and salary expected. Central Illinois. P-1295, Engineering News-Record.

(Continued on opposite page)

EMPLOYMENT NATIONAL COVERAGE OPPORTUNITIES

DISPLAYED RATE:

The advertising rate is $39.20 per inch for all advertising appearing on other than a contract basis. Frequency rates quoted on request.

An advertising inch is measured 7/8" vertically on a column—3 columns—30 inches to a page.

Subject to Agency Commission.

APRIL 9TH ISSUE CLOSES MARCH 30TH

UNDISPLAYED RATE:

$2.40 per line, minimum 3 lines. To figure advance payment count 5 average words as a line.

Position Wanted ads take 1/2 of above rate.

Box numbers—count as 1 line.

Discount of 10% if full payment is made in advance for 4 consecutive insertions.

Not subject to agency Commission.

Send NEW Ads and Inquiries to Classified Advertising Division or ENGINEERING NEWS-RECORD, P. O. Box 12, N. Y. 36.

• POSITIONS VACANT

(Continued from opposite page)

Construction company engaged in prestressed concrete requires office man for Operations Department. Duties involve purchasing and costs. Experience in accounting helpful. Opportunity for advancement. Location Long Island. Write full particulars. P-1279, Engineering News-Record.

Civil undergraduate engineering faculty assistance needed at ideal New England seacoast college located one hour from Boston. Send resume to Bradford Durfee College of Technology, Fall River, Mass.

Estimator. P.E., pricing for No. NJ G.C. State details, salary. P-1239, Engineering News-Record.

Engineer—Structural Steel Sales Promotion —we are searching for a young Civil or Architectural Engineer, preferably under 30, to handle technical and promotional work with customers of the structural steel fabricating industry. Headquarters will be in our regional office at Chicago, Illinois. Some travel through Northern Illinois and Indiana required. Applications should have a B.S. in C.E. or A.E. and preferably be registered. Experience in steel design and construction desirable. Salary open, depending upon experience. Insurance and retirement plans available. Send complete resume, recent photo if available, and salary requirements by mail to American Institute of Steel Construction, Inc., 101 Park Avenue, New York 17, New York.

Field Engineer, Washington, D. C., and southeastern Pennsylvania area. Graduate engineer with some construction experience desired. Engineer will service ready mix and products plants in Virginia, Maryland, and southeastern Pennsylvania. Salary, expenses and car furnished. Home over all weekends. Excellent opportunity to learn cement business. Send full particulars with first letter. P-1250, Engineering News-Record.

City Engineer—For City of 70,000 population located in southeastern Pennsylvania. Applicant must excel in sanitary engineering, and have knowledge of general municipal engineering problems. Applicant must qualify for Reg. in Penna. Furnish complete resume of education, experience and starting salary desired in first letter. Write P-1185, Engineering News-Record.

Resident Engineer Wanted. Graduate engineer with experience in supervision of construction on water, sewerage, steam power and or building construction. Location generally midwest, but assignments may be to other areas of U. S. Established midwest consulting engineering firm. Reply in detail to P-1293, Engineering News-Record.

• EMPLOYMENT SERVICE

Better Positions—$6,000 to $35,000. Want a substantial salary increase, more opportunity or different location? This national 48 year old service connects you with best openings. You pay us only nominal fee for negotiations; This we refund when employer pays placement fee. Present position protected. In complete confidence, write for particulars. R. W. Bixby, Inc., 559 Brisbane Bldg., Buffalo, N. Y.

• POSITIONS WANTED

BCE. 30. married; 6½ yrs. chem. plant const. & modification. Desire Florida location with construction or consulting firm. Experienced in structural, architectural and mechanical phases of const. PW-1242, Engineering News-Record.

Estimator-Construction Engineer. B.S.C.E., 20 years heavy and industrial construction. Will relocate. PW-1248, Engineering News-Record.

PROCESS ENGINEERS

McKee has permanent opportunities for Chemical Engineers experienced in process design for Petroleum and Chemical Plants.

Send detailed resume to
G. VICTOR HOPKINS

ARTHUR G. McKEE & Co.
2300 Chester Ave., Cleveland 1, Ohio

ESTIMATORS

Have openings for recent graduate Engineers in office of leading Southern California Building Contractor as Estimators. Prior experience unnecessary.

Send Complete Resume.

F. E. YOUNG CONSTRUCTION CO.
2141 MAIN ST., P.O. BOX 2872
SAN DIEGO 12, CALIFORNIA

• POSITIONS WANTED

Civil Engineer, age 35, B.S.C.E. Twelve years experience that includes office procedure, drafting, surveying, building construction, electrical distribution, steel design, and hwy. field construction with responsibilities and opportunities for advancement. Excellent references. Preferable location—Northeast U.S. section. PW-1215, Engineering News-Record.

Executive. Established Ability And Extensive experience, 23 years in all phases of heavy construction from field supervision to complete administration of large U.S. and foreign projects, including contract negotiations and processing claims. Inquiries solicited. PW-1239, Engineering News-Record.

Civil Engineer B.S.C.E., P.E., 34, 10 years steel mill and industrial construction experience. Competent in field supervision and layout. Available on short notice as superintendent or field engineer. PW-1240, Engineering News-Record.

Office Manager-Accountant Field or Main Office. Domestic or foreign. Heavy Const. Taxes, Payroll Cost, Timekeeping, Purchasing, Insurance. PW-1231, Engineering News-Record.

Administrator—12 years field office experience in all phases of general construction-mobile. PW-1223, Engineering News-Record.

United Kingdom or Europe. Engineering administrator-supervisor. Extensive overseas experience. PW-1175, Engineering News-Record.

Canadian Civil Engineer—23—Single—With experience in industrial building and railway fieldwork desires foreign employment. PW-1074, Engineering News-Record.

Professor of Structural Engineering, 16 years experience teaching and industry, age 36, desires teaching position. PW-1079, Engineering News-Record.

Senior Highway Designer or Project Engineer—Age 50. Thorough knowledge of modern multi-lane and interchange design. Registered Georgia and Florida. Southeast. Available March 15. PW-1146, Engineering News-Record.

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Construction Engineer available 1st of May. C.E. degree from Tri-State College 1950. Broad experiences in industrial building—both field & office. Prefer overseas assignment but will consider domestic job. Present Salary $185/wk. PW-1220, Engineering News-Record.

Civil Engineer—Ten years' experience. Highway, Municipal; Industrial Design; Licensed California. PW-1151, Engineering News-Record.

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P-1259, Engineering News-Record
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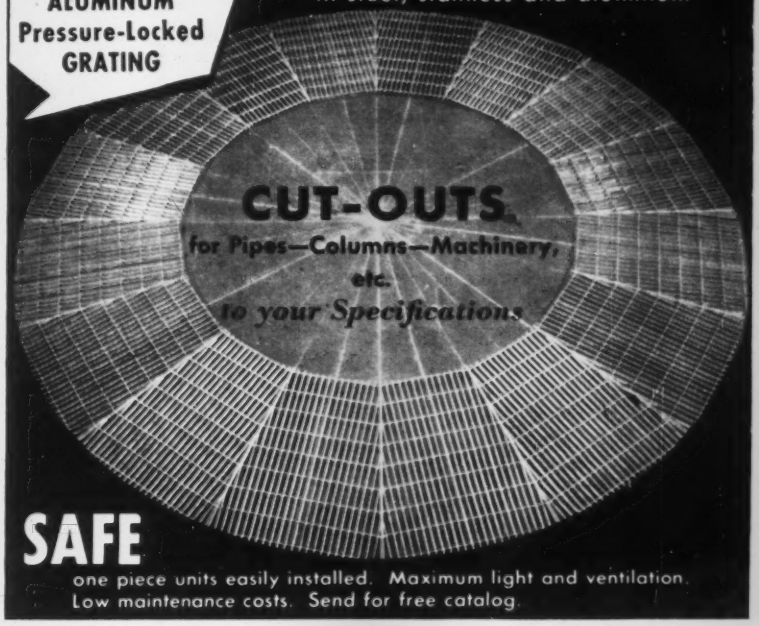

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First of Five

It was to be expected that the Interior Department's choice of a "submerged tube" distillation process for the first of the government's authorized plants for saltwater conversion would not be viewed with unqualified approval by those who deem other processes to be better. Since, however, this is merely the first of five to be selected, criticism is not likely to become very vocal.

Actually, it is debatable whether Interior could, or should be expected to, justify its first choice purely on merit. In any event, the other processes will have their innings on the remaining plants—two more for seawater and two for brackish water.

Among the processes to be selected, those using flash evaporation (for seawater) and ion-selective membranes (for brackish water) seem to be high on the list of probabilities. The government is already involved in a study of the feasibility of using nuclear heat for a flash evaporation process, and plants utilizing ion-selective membranes are already on the market.

In any case, all the processes for the five-plant program will be known fairly soon. The Interior Department has announced it will disclose its other choices at three-month intervals. In the meantime it is hoped that Congress will appropriate the necessary $10 million for its authorized program. Considering the objective—it is a research bargain.

Controlling Bolt Tensioning

High-strength bolts, fasteners that were virtually unknown a decade ago, are now being used extensively for structural steel connections in the field. The general acceptance of this new type of fastener in such a short time by the conservative construction industry testifies to its excellent performance in actual service.

In view of this service record, plus the fact that high-strength bolt practice is well backed by careful research, a letter from a reader reporting on some bolt failures (ENR Jan. 29, p. 8) was puzzling and disquieting. His conclusion was that "many bolts will not only relax before they reach the yield point, but will, in fact, elongate and fail over a period of time."

This conclusion is now challenged by another reader on p. 6 of this issue. He points out that considering the characteristics of material meeting the requirements of ASTM Specification A325, high-strength bolts could not behave as the first reader charged. Either improper material was used or the bolts were drawn too tight and breakage resulted.

Connections made with high-strength bolts place a premium on the high clamping force of the nut and bolt head produced when the bolts are tightened. The bolt tension prevents the nut from loosening, improves fatigue strength of connected parts and develops greater rigidity in resisting impact and seismic loading.

The clamping force is roughly proportional to the torque applied to tighten the nut on each bolt; so torque has been used as a measure of bolt tension. However, the proper torque-tension ratio to use in a particular case is uncertain. Even with careful control of tightening, the amount of tension delivered varies.

This has been the major source of trouble in the past, and much research has been devoted to development of means of insuring accuracy of bolt tension. It is not the amount of tension to use that is open to question, but human ability to follow recommended practice.

When high-strength bolts first came into use, they were tightened with a 6-ft torque wrench, the torque being measured on a dial. This tool was subsequently replaced by the labor-saving impact wrench, on which torque is regulated, by throttling the air pressure delivered, on the basis of calibrator readings of the tension in a sample bolt.

Sampling, however, being too subject to human error, American Association of Railroads researchers sought a means to improve this technique. They came up with the observation that one-half turn of the nut after the parts of a connection are drawn up snug provides more accurate control of the clamping force than dial readings on torquing tools. This is the simple control method advocated in the letters in this issue.

Nothing is really foolproof. But experience to date with high-strength bolts shows that they are near enough to that desirable state to warrant their popularity as a connecting device.

Better Inspection

Some thought-provoking comments on construction inspection appear in the March issue of The Constructor, magazine of the Associated General Contractors. They occur in a letter written by M. Clare Miller, AGC co-chairman of the AASHO-AGC Joint Cooperative Committee, clarifying AGC's position in urging adoption of end-result specifications for highway work.

It had been claimed that AGC also wanted to eliminate engineering inspection. On the contrary, Mr. Miller said, AGC believes that standards of inspection would need to be raised under end-result specs.

What he said that is worth pondering is, "We feel that worthwhile engineering man-hour savings can be made through a competent inspector checking results, in lieu of several inspectors counting roller passes and oil hours, water gallonage, and other 'methods' inspection requirements."

Another name for "methods" inspection is "policing." It doesn't work, and it can't be made attractive as a career. Why not eliminate it for something better?

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3.

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4.

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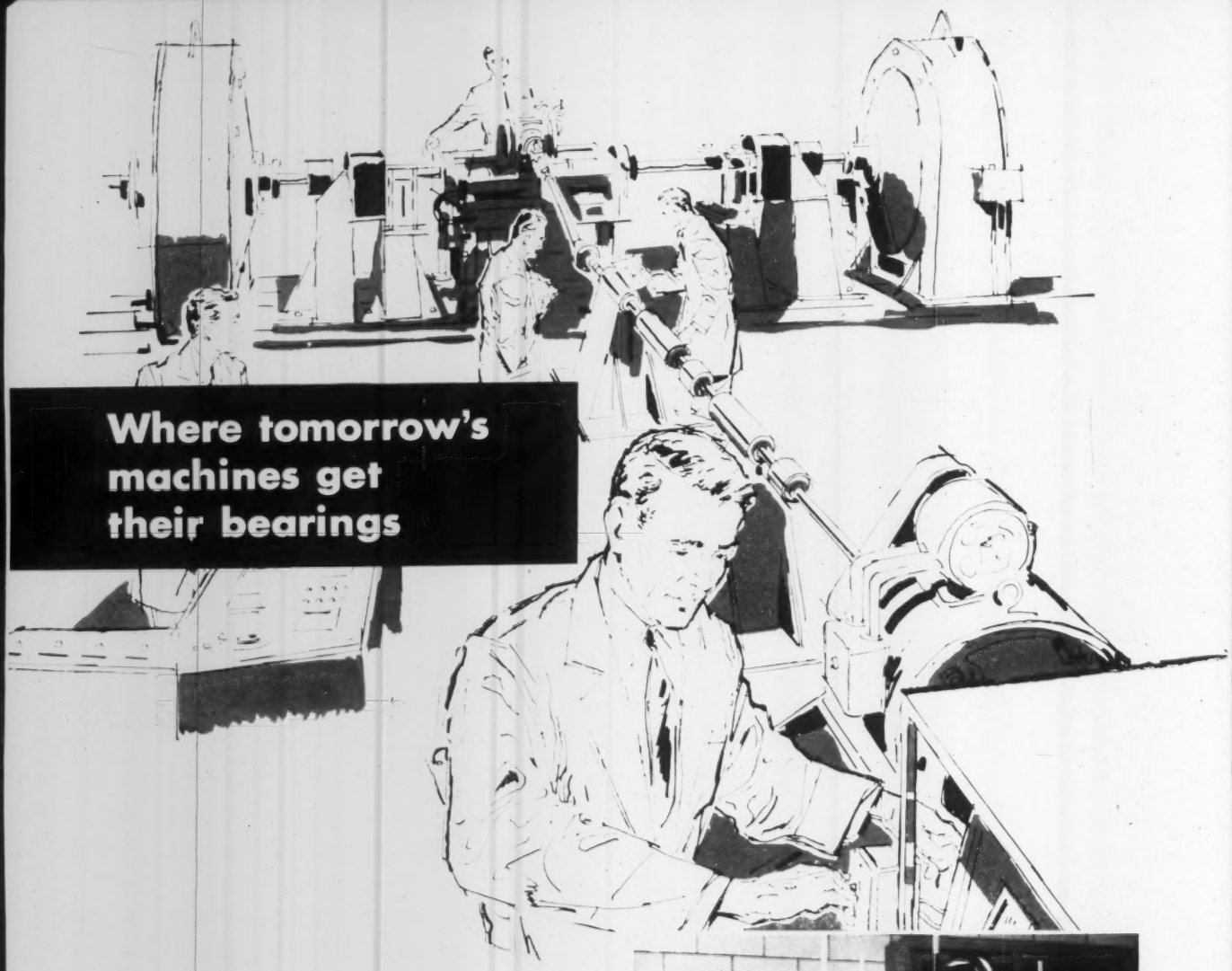

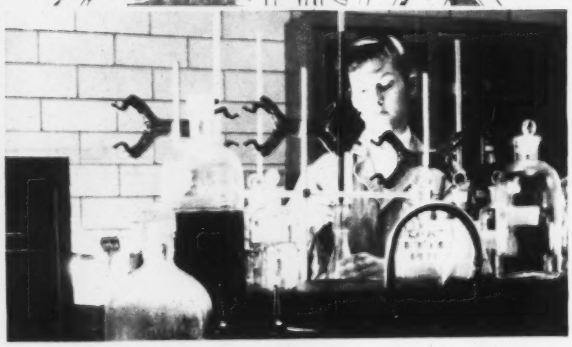

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